TOWN PLANNING IN MADRAS

By H. V. Lanchester.

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TOWN PLANNING IN MADRAS

A Review of the Conditions and Requirements of City Improvement and Development in the Madras Presidency.

By H. V. Lanchester, F.R.I.B.A., M.T.P.I., etc.

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PREFACE.

The lectures on which this book is based were delivered in Madras in January, 1916, but having had during the following months further opportunities for studying the conditions and requirements of the principal cities in the Madras Presidency, I have thought it desirable to revise and expand them, utilising reports and plans prepared subsequently. In these addresses to municipal councillors and officials the intention was twofold. Firstly to give a broad view of the general principles of town planning and the necessary preparatory work, and secondly to point out how these studies would apply to economic and social conditions in Madras. As far as practicable, the earlier chapters deal with principles universally applicable and form a brief primer on the subject, while in the later ones the problems of Madras are more specifically dealt with.

In acknowledging my indebtedness to the editors of the *Town Planning Review*, Mr. E. B. Havell and others, for the loan of illustrations, I take this opportunity of expressing my thanks to all those of whose labours I have made use in the following pages. The introduction to Chapter XII. is mainly compiled from the work of Col. H. D. Love, "Vestiges of Old Madras."

H. V. LANCHESTER.

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MAPS OF MADRAS—M. I. TO M. XIII.

INTRODUCTION.

*By H.E. The Governor, Baron Pentland of Lyth, P.C., G.C.I.E.**

We are familiar in India, as they are in the West, with the problem of the housing of the people in our towns and our villages, and in India in recent years that problem has received increased attention. A desire for improved dwellings and for better surroundings and increased amenities has manifested itself among all classes of the population. It is not only the wealthy vakil or the merchant who seeks some suburban retreat where he can find relaxation from his business in gardening and beautifying the surroundings of his house and under conditions which will not divorce him from electric lights and fans and other luxuries which the conditions of this climate demand, but it is also a fact that we want to bring home to the population who are not able to share in these benefits the advantages of good water and pure air and cleanly surroundings and other things which are indispensable to health. A prosperous exchequer has enabled the Government in India for some years past to do a great deal in this direction, and although, unfortunately, at the present time, when funds are not so freely available for these purposes, our activities will be restricted, I do not think we need regret this altogether if we are able, as we are fortunately able, to think out the problems before us and obtain a fuller comprehension of the difficulties which we have to face and the manner in which we ought to approach them. It is but natural that we should turn for guidance in these matters to the West, at anyrate at first, because it is there that the difficulties of adapting an old civilisation to the complex conditions of modern society have already in some way been successfully tackled. These difficulties have absorbed the attention of municipal administrators in Europe and America for some time, and they have given extended opportunities to the activities of the architect, the artist, and designer, and have called into being a class of town planning experts whose special function it is to co-ordinate these activities and, above all, to harmonise them with the past. The cathedral close in Europe or the temple square here, the market or the bazaar, the port or the bunder, the palace or the mahal, the castle or the fort, and so forth—they are all different manifestations of the same aspect of human activity, whether singly or combined; and they have given, in their turn, to the different cities, their predominant motive, derived from the ambitions and occupations of their inhabitants. These have determined the growth of the cities. I think it is fitting that we should acknowledge that it is due to Professor Geddes, whose lectures greatly stimulated here public interest in these matters, that we are familiar with the conception of a city as an organic growth. Mr. Lanchester, too, urges us to deal with the present needs of our cities in a spirit of reverence and sympathetic appreciation of their past history.

How, then, are we to deal with these needs so as at the same time to satisfy the present? In answering this question I have no doubt we shall derive from these

* Extracted from H.E. the Governor's speech on opening the author's course of lectures in Madras.

discourses much valuable suggestion and help. We have already done something to elucidate parts of the problem before us, and one part of that problem is the individual house. We have got to settle not only the grouping of houses but the conditions of individual houses. We are doing something in that direction. In considering the arrangement of the dwellings of our citizens in relation to each other, the lines on which those dwellings themselves should be constructed so as to meet the demands of the sanitation and the comfort and domestic requirements of the inmates must also be determined. That is essentially a matter on which Indian experience must help us; and it was in order to elicit their criticisms and suggestions the collection of model houses and building designs of various kinds was included in a recent exhibition, to give us some material to judge of the different classes of houses that are needed.

Chapter I.

THE ETHICS OF TOWN PLANNING.

This introductory discourse, maybe, has somewhat the flavour of a homily, but with the art that for the want of a better name we have come to call Town Planning, the ethics are the really important and vital factors. We cannot have good towns unless we are morally qualified to use them.

Probably few of us could claim that our life has much more of virtue in it that we find conducive to our own happiness. An interesting parallel between the buildings of the East and the buildings of the West has been referred to, and I think that this comparison might also be extended to the religions of the East and the religions of the West. All religions recognise the probability just mentioned, and point out more or less emphatically that the altruist will be happier than the individualist. The Hindu teachings more than most others emphasize the view that the individual should seek to merge himself spiritually in the universe. One may quote a sentence from one of their own teachers :—

"Man takes up all the various relationships of life, as father, as mother, as friend, as lover; he exists as all these, and the last point comes when he becomes one with the object of worship that I am you, and you are I, and worshipping you I worship myself, and in worshipping myself I worship you. There we find the highest explanation of that with which man begins. Where we begin, there we end. At the beginning it was love for the self, but the claims of the little self made love selfish; at the end came the full blaze of light, when that self had become the infinite."

If you look into your books you will find that all has been said that is necessary for the understanding of communal duties. As an example from the Maha-Nirvama-Tantra :—

"The householder by constructing reservoirs for holding water, by planting trees on the roadsides, by establishing almshouses for men and animals, by making roads and building bridges, goes towards the same goal as the greatest Yogin."

The great factor in our programme for cities is the voluntary one. We all know that a criminal is not made virtuous by punishment. No more can you perfect a city by Town Planning Acts or municipal by-laws. A city can only become beautiful, convenient, and clean by the united efforts of its inhabitants. If such is their will and determination, laws are not needed, direction only is required.

Without this spirit, rules and regulations can only mitigate the worser evils, determining what must not be done, rather than indicating what might be done; the standard is bound to be near the lower end of the scale instead of near the higher.

But, it may be said, there must be rules and regulations. Man being imperfect, this may be conceded, but let us see whether something more may not be made of man —first.

His own house inevitably receives a man's first attention, but his street may benefit by the natural extension of his effort. If he can be induced to take an interest in the beauty of his garden, his neighbours will appreciate this, the natural extension of his efforts. He will also induce his family and especially his children to take a hand in this work, where municipal improvement and Town Planning really begins, the work of improving the house and its immediate surroundings; voluntary local organisation is thus initiated.

The old traditions of cleanly living, and the old standards of sanitation, only need bringing into relationship with the altered conditions of modern life to achieve here a remarkable transformation.

Again, in building there exists plenty of guiding principles which merely need a little adaptation. Not only, to remind you of the sentence quoted before, on the duty of the citizen in assisting, according to his means, to supply communal needs, but also in making his private undertakings subservient to the public weal.

To quote a sentence extracted from the Manasara Silpa-sastra by Ram Raz :—

"The height of the buildings should correspond in every street, as far as practicable, and in all structures of the same number of storeys.

It is not necessary to endorse this prescription, its value is in showing that unity of action is recommended.

If the city is to emulate the glorious cities of the past—to emulate, not imitate—all must regard their own activities as subservient to some great united aim. Thus may a new development arise. It cannot come from the mind of one man, however brilliant. The trouble with us—the experts, may we call ourselves?—is that we are almost bound to base our ideals too much on the fine things we are familiar with, not recognising that they may often be exotic and not a true interpretation of needs and character.

But, then, those who have actually to make the city, its inhabitants, rarely have the imagination to realise how these needs may best express themselves—that is where the artist comes in; therefore his contribution is needed, while the course he adopts must be a logical one, based not on his dreams but on hard facts, on rational requirements, and on legitimate sentiments.

The initiative in respect to these facts and requirements rests with the people; their leaders must endeavour to bring out all the latent aspirations towards a fuller life that they possess, and then call on the Town Planner to give material form to the demands this life will make.

In considering the methods by which this can best be done, we may take as types of organisation the army or the school—each at their best—with the assumption that advancement and authority are the rewards of probity and ability, so that each small group has its leader, who in turn forms one of a group of his own grade, under a head, citizen private. citizen lieutenant, citizen captain, &c. The gap between the private citizen and the municipal council is too great, and the usual sub-divisions of the city somewhat too arbitrary. Something much more intimate is needed to get the best service out of every one, some smaller area in which to take a special interest, some volunteer leader to direct and advise in regard to this area. It is gratifying to note that in the United States there are many little societies which feel more or less the responsibility for their own special areas, streets, and squares.

Thus the family careful of its home expands into the small community careful of its district, and the higher officers correlate the activity of the district to the activity of the ward, while the municipality is left to deal with those matters affecting the city as a whole. Co-operation, in more than an economic sense, arises. The lack of this is the reason why it has been found necessary to rediscover, as it were, the so-called art of Town Planning. This was not always consciously an art; it came naturally when communities existed as such, and not as heterogeneous and discordant masses of individuals; but now the expert has to be called in, ostensibly to initiate Town Planning schemes, while really the most useful thing he can do is to explain why Town Planning does not exist, and never will exist, until communities in general wake up to the sordid conditions of life around them and make up their minds to live as a community, and not as selfish units.

NEW TANK, KALIARKOVIL 1
The work of the Zemindar of Devakota

SURSAGAR TANK, BARODA CITY 2

Among the civilisations of the past there have been many periods when municipal activities owed much to the public spirit of at least the more influential citizens. With the Greeks the people united to lavish the finest of their art on religious and other public buildings. The resources of state, city, and individual were all drawn on to this end, and any attempt to approach an equal standard of work in private buildings was regarded with disapprobation. The Romans were less democratic at the time when they began to model their culture on that of the Greeks, but even with them the public services took a high place in their economy.

A few quotations illustrating the conditions under the Roman Empire are not inapplicable to the position of affairs in India at the present time:—

*While the emperors were responding to the call of charity by using the resources of the State, it is clear, from the letters of Pliny and from the inscriptions, that private benevolence was even more active. Pliny has a conception of the uses and responsibilities of wealth which, in spite of the teaching of Galilee, is not yet very common. Although he was not a very wealthy man, he acted up to his principles on a scale and proportion which only a few of our millionaires have yet reached. The lavish generosity of Pliny is a commonplace of social history. Pliny, the distinguished advocate, the famous man of letters, the darling of Roman society, still remained the loyal son of Como, from which his love never strays. He followed and improved upon the example of his father in munificence to his native place. He had little liking for games and gladiatorial shows, which were the most popular objects of liberality in those days. But he gave a sum of nearly £9,000 for the foundation of a town library, with an annual endowment of more than £800 to maintain it. Finding that promising youths of Como had to resort to Milan for their higher education, he offered to contribute one-third of the expense of a high school at Como, if the parents would raise the remainder. The letter which records the offer shows Pliny at his best, wise and thoughtful as well as generous. He wishes to keep boys under the protection of home influence, to make them lovers of their mother city; and he limits his benefaction in order to stimulate the interest of the parents in the cause of education, and in the appointment of the teachers.

"Yet Pliny is only a shining example of a numerous class of more obscure benefactors. The gifts were sometimes made merely to win popularity, or to repay civic honours which had been conferred on the populace. They were too often devoted to gladiatorial shows and other exhibitions which only debased the spectators. Yet the greatest part of them were expended on objects of public utility—baths, theatres, markets, or new roads and aqueducts, or on those public banquets which knitted all ranks together. There was in those days an immense "civic ardour," an almost passionate rivalry, to make the mother city a more pleasant and a more splendid home.

"With regard to municipal expenditure, the budget was free from many public charges which burden our modern towns. The higher offices were unpaid, and, in fact, demanded large generosity from their holders. The lower functions were discharged, to a great extent, by communal slaves. The care or construction of streets, markets, and public buildings, although theoretically devolving on the community through their aediles, was, as a matter of fact, to an enormous extent undertaken by private persons.

"The cities did much for themselves out of the public revenues. But there are many signs that private ambition or munificence did even more. The stone records of Pompeii confirm these indications in a remarkable way. Pompeii, in spite of the prominence given to it by its tragic fate, was only a third-rate town, with a population probably of not more than 20,000. Its remains, indeed, leave the impression that a

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* Roman Society from Nero to Marcus Aurelius. Samuel Dill, M.A.

considerable class were in easy circumstances; but it may be doubted whether Pompeii could boast of any great capitalists among its citizens.

"Nevertheless, a large number of public buildings of Pompeii were the gift of private citizens. The Holconii were a great family of the place in the reign of Augustus. M. Holconius Rufus had been ordinary duumvir five times, and twice quinquennial duumvir; he was priest of Augustus, and finally was elected patron of the town. Such dignities in those days imposed a corresponding burden, and an inscription tells that, on the rebuilding of the great theatre, probably about 3 B.C., Holconius Rufus and Holconis Celer defrayed the expense of the crypt, the tribunals, and the whole space for the spectators. The literature of the age contains many records of profuse private liberality of the same kind. It has been calculated that Pliny must have altogether given to his early home and fatherland, as he calls it, a sum of more than £80,000; and the gifts were of a thoroughly practical kind—a library, a school endowment, a foundation for the nurture of poor children, a temple of Ceres, with spacious colonnades to shelter the traders who came for the great fair.

"But the prince of public benefactors in the Antonine age was the great sophist Herodes Atticus, the tutor of M. Aurelius, who died in the same year as his pupil, 180 A.D. He acted up to his theory of the uses of wealth on a scale of unexampled munificence. The liberality of Herodes Atticus, however astonishing it may seem, was only exceptional in its scale. The same spirit prevailed among the leading citizens or the great patroni of hundreds of communities, many of them only known to us from a brief inscription or two. The objects of this liberality are as various as the needs of the community—temples, theatres, bridges, markets, a portico or a colonnade, the relaying of a road or pavement from the forum to the port, the repair of an aqueduct, above all the erection of new baths or the restoration for the free enjoyment of this greatest luxury of the south. The boon was extended to all the citizens of both sexes, and in some cases, even to strangers and to slaves. There is an almost monotonous sameness in the stiff, conventional record of this vast mass of lavish generosity. It all seems a spontaneous growth of the social system. One monument is erected by the senate and people of Tibur to a man who had borne all its honours, and had left the town his sole heir. On another, an Augustal of Cales, who had received the insignia of the duumvirate, tells posterity that he had laid down a broad road through the town. Another benefactor bore the chief cost of a new meat market at Aesernia, the authorities of the town supplying the pillars and the tiles. A priestess of Calama in Numidia expended a sum of £3,400 on a new theatre. Perhaps the commonest object of private liberality was the erection or maintenance of public baths. An old officer of the fourth legion provided free bathing at Suessa Senonum for every one, even down to the slave girls. At Bononia a sum of £4,350 was bequeathed for the same liberal purpose.

"The Antonine age was, on one side, perhaps rather coarse in its ideals, passionately fond of splendour and brilliant display, proud of civic dignity, and keenly alive to the ease and comfort and brightness which common effort or individual generosity might add to the enjoyment of life. It was also an intensely sociable age. Men looked for their happiness to their city rather than to the family or the state. If their city could not play a great part as an independent commonwealth, it might, by the self-sacrifice of its sons, assert its dignity among its rivals.

"There was much selfishness and grossness, no doubt, in all this civic life. Which later age can cast the first stone? Yet a study of the inscriptions of the Antonine age leaves the impression that, amid all the sharply-drawn distinctions of rank, with all the petty ambition and self-assertion, or the fawning and expectant servility, there

KALIARKOVIL, MADRAS 3
Work in progress at the Temple

TIRUVANAMALAI, MADRAS 4
Bird's-eye view of Temple

was also a genuine patriotic benevolence on the one hand, and a grateful recognition of it on the other. Notwithstanding the aristocratic tone of municipal society in the age of the Antonines, it is possible that the separation of classes in our great centres of population is morally more sharp and decided than it was in the days when the gulf between social ranks was in theory impassable."

Passing to mediæval times we find that as civic life once again became definitely formulated private initiative took its share in municipal activities. First we have the great cathedral, the recognised centre of city life. Then the monastic and educational establishments, and somewhat later the City Hall and the Guild centres, all products of the voluntary efforts of the citizens, who participated in the work according to their means and who, whether rich or poor, took the keenest interest in all efforts tending to the advancement and embellishment of the city.

It will be seen that the dominating influence in mediæval times was that of religion, all the more notable efforts being more or less related to the moral ideals of the age. In this there is a clear parallelism with similar efforts in India at the present day, where the temple and its adjuncts, the temple tank and the chatram (or rest house) owe much to individual piety, as may be seen from the accompanying illustrations showing some of the work recently carried out and actually in progress. Nor are the claims of education neglected ; it is probable that in proportion to its wealth, India gives more largely to educational establishments than any other nation.

Thus there is every ground for hope that in the future civic life as a whole may receive considerable impetus from the voluntary efforts of the wealthier classes and that these efforts will secure recognition from, and advance the ideals of, those less able to contribute to the cost of large undertakings, but yet able to assist in maintaining a good standard of municipal life.

To continue our review of civic ideals in the past we find that with the broadened outlook brought in by the Renaissance the concentration on the life of each individual city became less intense. Various activities, social and political, came into competition with those which had hitherto been concentrated. Greater knowledge of the world in general was acquired, partly through a wider range of scholarship, this developing a passion for exploration. Following the explorer came the opportunities for development overseas and then the enormous expansion of commerce with national rivalries in these forms of enterprise.

As may well be imagined, the attention of the more vigorous minds was diverted into these channels, and the condition of affairs in the old cities tended to stagnate. This stagnation would have been still more marked had not the increased wealth disguised to some extent the true state of affairs, so that we see cities still expanding on new lines with features of architectural beauty and dignity. These developments, however, took forms more and more removed from the interests of the people as a whole and represented the ideals of the few rather than the many.

Thus during the seventeenth and succeeding centuries the tendency was towards the gratification of individual taste and comfort at the expense of communal advancement. This produced the palaces, parks, and avenues that give so much dignity to European cities of the period, but the inception of these was aristocratic in its basis and took little account of the hygienic and social needs of the poorer classes, whose lives became more and more sordid.

At the same time the artistic contributions of this period are not to be overlooked, affording as they do valuable suggestions for the embellishment of our cities, provided we are careful to consider them in due relation to the social ideals of our own day.

Following this the sudden expansion of industrial activity, when new methods of production were evolved with a rapidity that left no time for corresponding readjustment to meet these changes, threw the rest of our social system into a state of chaos from which we are only gradually disentangling ourselves.

Thus in the nineteenth century even the limited ideals of the eighteenth disappeared, and for the first time in history we find large aggregations of homes, massed together without thought of health, beauty, or even foresight for the future. Nothing was taken into account but the urgent need to put as many people as possible in close proximity to the mill or factory where they were employed.

Bad as you may consider some of the congested quarters of the larger Indian cities to be, when looked at from all points of view they can hardly be regarded as worse than some of the industrial quarters built in England in the earlier half of the nineteenth century. In India epidemics claim a heavier mortality, but in every other respect the life of the factory hand of three generations back was almost inconceivably devoid of all that makes life worth living.

When the evil results of this lack of foresight and system became apparent, the movement for reform commenced. The more material aspects first secured attention, and schemes for drainage and water supply took shape. By-laws for securing a certain proportion of open space were enacted, and building regulations were framed. These measures operated beneficially for some half-century, despite defects due to their inherent rigidity in application. Uniformity in the spacing of roads and methods of building is not only wasteful but encourages a monotony of effect deadening to the individuality of those occupying these areas.

No provision was included for recreation either for children or adults. Everyone was assumed to have the same requirements, and thus personal initiative was discouraged.

It was realised that some essentials to a vigorous social life had been forgotten, and bit by bit attempts were made to supply these; parks and playgrounds were seen to be necessary. Improved transit facilities took the population further afield, and out of this grew up the Garden City and Garden Suburb movement. In the end, however, it became obvious that all these factors needed correlation into a comprehensive study on scientific lines, and this has been formulated under the somewhat too narrow title of Town Planning.

We owe much of these developments to some of the great manufacturers, who, recognising that their precursors had been heinous offenders in their unthinking exploitation of labour, set themselves to do everything possible to free the industrious classes from the monotony inevitable in this type of occupation. After some earlier efforts we find men like Lord Leverhulme, George Cadbury, Joseph Rowntree, and now many others devoting their lives quite as much to the welfare of their employés as to the success of their business, regarding both as inseparable parts of the great concerns they control.

You will not expect to see the same types of building in India as in Europe, but there is plenty of opportunity for the construction in a rational, simple, and interesting way, of Indian houses and Indian homes that will look just as pleasant.

You will note that these activities include not only housing, but buildings of various kinds for public worship, education, and recreation. From the earliest times such buildings have been undertaken by patriotically minded citizens, and India can justly claim that she owns many such, the temples have been beautified and educational buildings are not neglected—in the latter case, we know, much more has yet to be done, but it will be done without a doubt, if India remains true to her past traditions.

It is not in the power of all to undertake such works as these. It is, however, open

GWALIOR

The Central Square, Lashkar, with monument to his father, erected by Maharajah Scindia

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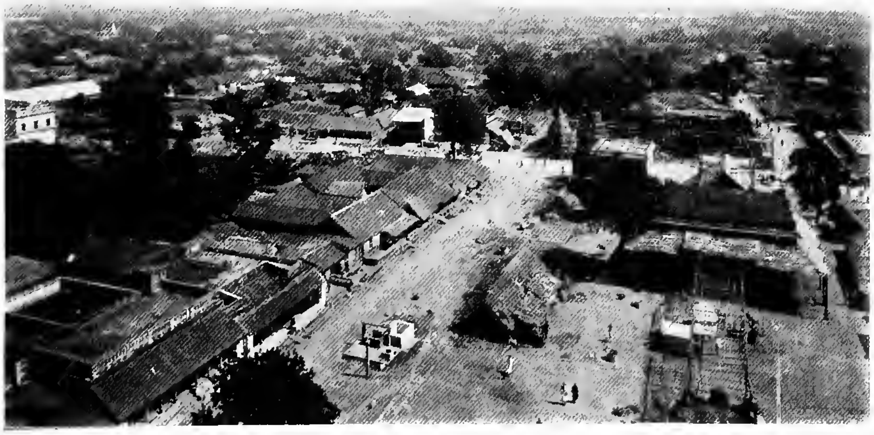


TIRUVANAMALAI, MADRAS

Square in front of Temple, a place of pilgrimage

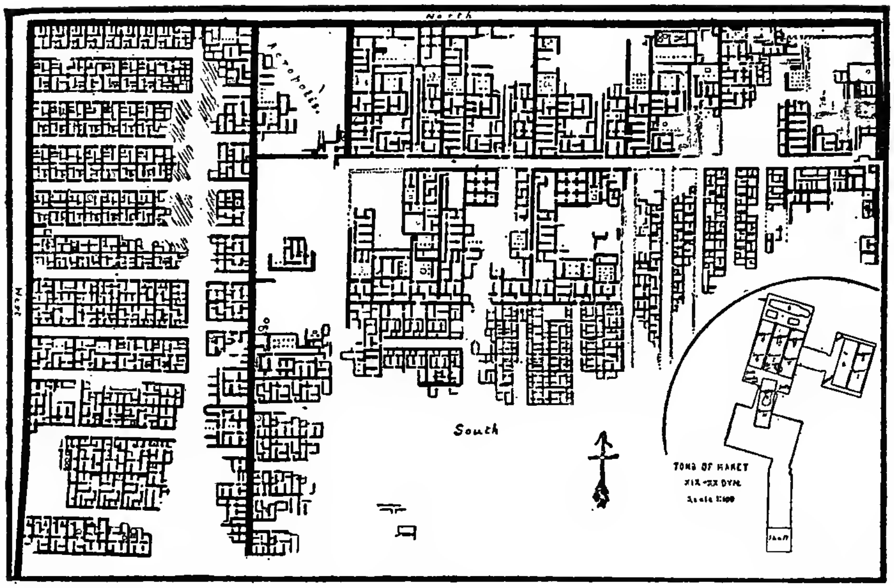
6

to every man to throw his influence into the scale on the side of the improvement and beautification of the city and all its components; its churches or temples, its schools, its parks, avenues, and playgrounds, its tanks and gardens, not to speak of other more utilitarian matters. The private citizen, and more particularly the municipal leaders, can study and point out the city's needs and, if active and persistent, will create a movement bearing down all obstacles.

Then again the municipal official need not regard himself, as he has too often one fears been taught to do, as a kind of superior policeman whose main duty it is to look out for infractions of the regulations, but rather as one whose privilege it is to help the townspeople to see where they can help on the progress of their town, often with no detriment to their personal interests; but even where some slight immediate sacrifice has to be made, in the long run to their benefit as members of a happier and healthier community.

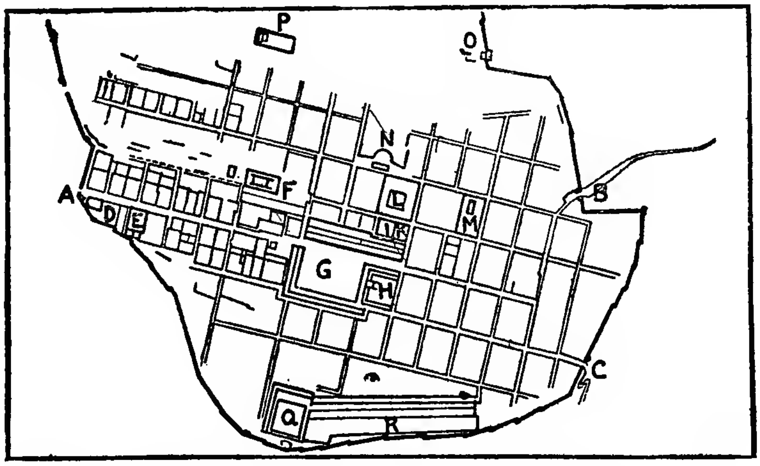
Those who have the interests of the city in their charge must try and handle them in a sympathetic fashion, not interpreting their duties in the narrow spirit of simply restraining the man who is doing wrong, but rather, with superior technical knowledge, showing him how, by a slightly different course, he can do better for his fellows, and not infrequently for himself at the same time. He can be convinced that a few rupees in his pocket for a few years are a very poor bargain if they are gained to the detriment of his tenants or his neighbours—that his civic morality would in such a case be little better than that of a burglar. Often again he errs merely through ignorance of the best way to achieve his aims. Here again official skill should help him and should be at his disposal. The enhancement of this skill is the object of these studies in Town Planning.

The man who gives thought and ability to the problems of the city is worth more to it than he who spends money. Both are needed, but no one need be discouraged because he cannot be lavish in expenditure; if he spends his brains, he will get ample satisfaction for his exertions in seeing his city become a model to those around it, and a pleasure to all who walk through its streets.



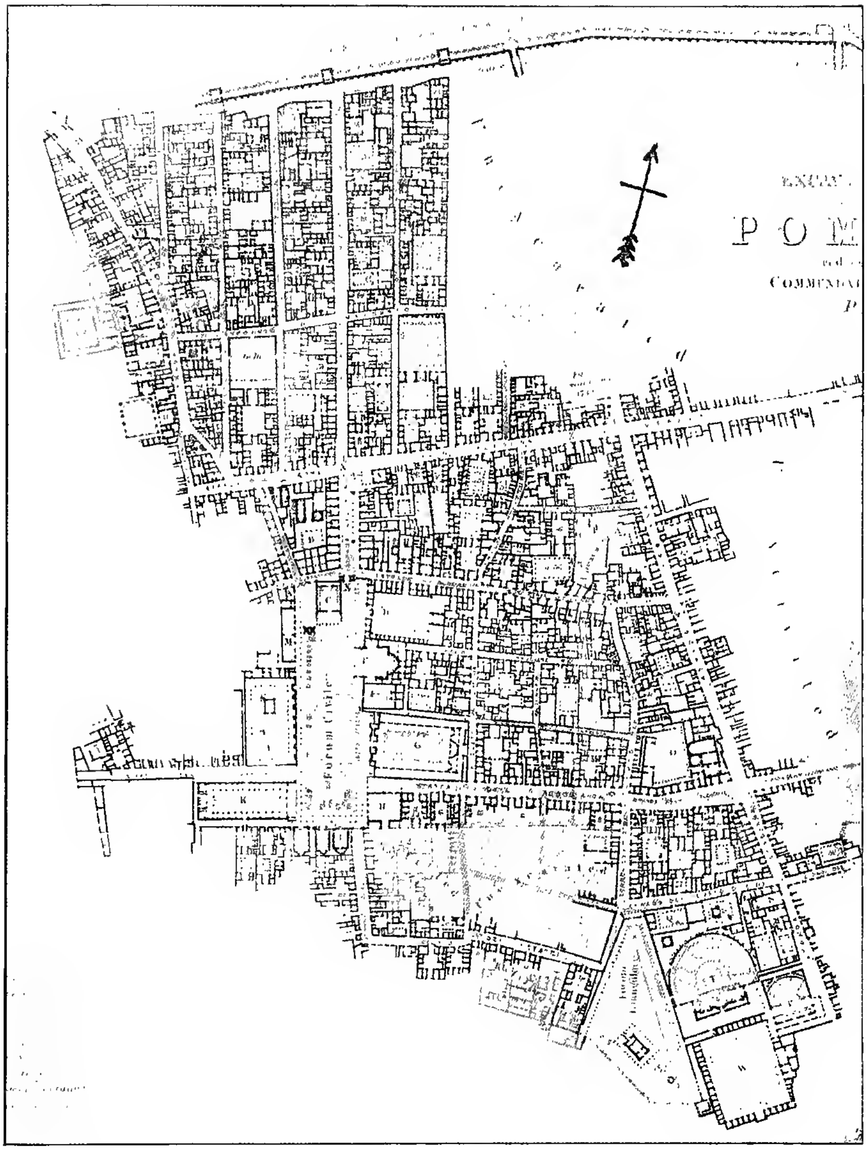
PLAN OF KAHUN, EGYPT, 2,500 B.C. 7

(Professor Flinders Petrie).



PLAN OF THE GREEK CITY OF PRIENE. 8

A. B. C. Gates. D. E. F. H. M. P. Temples. G. Agora (Market).
I. Council House. K. Prytancion. L. Q. Gymnasium.
N. Theatre. O. Water Reservoir. R. Racecourse.



POMPEII 10

Chapter II.

HISTORICAL OUTLINES OF TOWN PLANNING.

Studies in the history of Town Planning have hitherto been made unduly complex by a lack of recognition of the basic principle that its practice follows, at some little distance behind, the structural methods employed in building.

Man's first buildings were probably circular in plan, but as soon as his needs extended to more than one chamber the advantages of rectilinear construction were so obvious that the latter became general. This is very clearly shown in India, where those accustomed to a single room still continue to erect circular huts, while as soon as two or more rooms are required the huts assume a rectangular form.

Now rectangular buildings suggest rectangular blocks, and at first it is only due to imperfect organisation or insuperable natural difficulties that the city is not laid out on rectangular lines. Even in the earliest times we find that where the control was strong enough the scheme was a rectangular one, and from thence onwards up till the sixteenth century, where the plan was consciously determined, it conforms to this method (See 7.) Even since then the same rather rudimentary idea has governed the plan of most of the large cities of America.

The principal factor operating in antagonism to the rectangular plan will be found to be that the natural lines of route around a city are radials, and that as the city grows it extends along these lines.

With a small town or village probably four approaches suffice, and then the rectangular plotting is not disturbed, but with increasing importance roads in other directions are established, and extensions adapt themselves to them. In the case of a town that does not show signs of any definite planning, the main thoroughfares are generally irregularly radial.

As formal building preceded formal Town Planning, we find temples and palaces being laid out on regular lines, while the towns generally were still left to chance. The planning of the Acropolis, though not symmetrical, was carefully studied, while the surrounding Athens was a congeries of irregular streets.

The later Greek cities were, however, far more regular, and where the ground permitted, were uniformly rectangular. (See 8.)

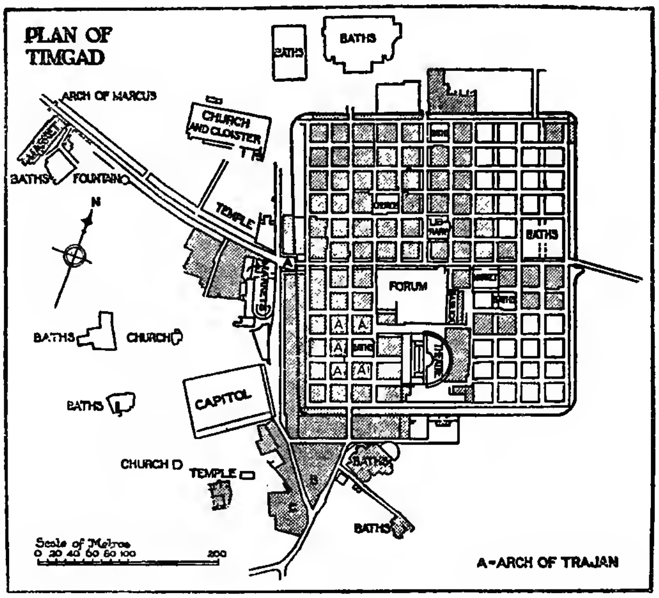
The Roman cities in the latter days of the Republic, and subsequently, were planned on the same lines and rigidly rectangular. In many cases their plotting was based on that of the military camps, a fact which need not surprise us when we learn that many of the provincial towns were colonised by ex-soldiers. (See 9.)

Though the Romans employed circular forms to a large extent in the planning of their buildings, their streets and roads were all laid down on straight lines. The block or insula in the Roman town was usually square or nearly so, but in some cases it was realised that this was unnecessarily extravagant, and that while some 120 to 160 feet was a suitable space between the residential streets, the cross streets might be three or four times that distance apart. In these cases the road plan has a general similarity to that of the nineteenth century, but of course the houses were quite different in character to the modern European house, though closely akin to the Indian house of the courtyard type. (See 10.)

A somewhat notable development of the Roman plan took shape in Asia Minor and other colonies where the climate was hot. The two principal streets crossing in the centre of the town were furnished with colonnades at least as high as the adjacent

houses, a feature which must have greatly enhanced the effect and convenience of the place. At the present time covered footways are very usual in southern Europe, but in these days the upper stories of the buildings usually extend over such arcades.

We may take up our story again at the period following the collapse of the Western Empire of Rome. In the anarchy which ensued most of the Roman "colonial" cities were destroyed or fell into decay, only a few of the more important being maintained. In some of these the Roman plotting may be traced, in others it has almost disappeared. The sites of the destroyed towns have in most cases been re-occupied, but it is infrequent that the influence of the Roman plan is very obvious.



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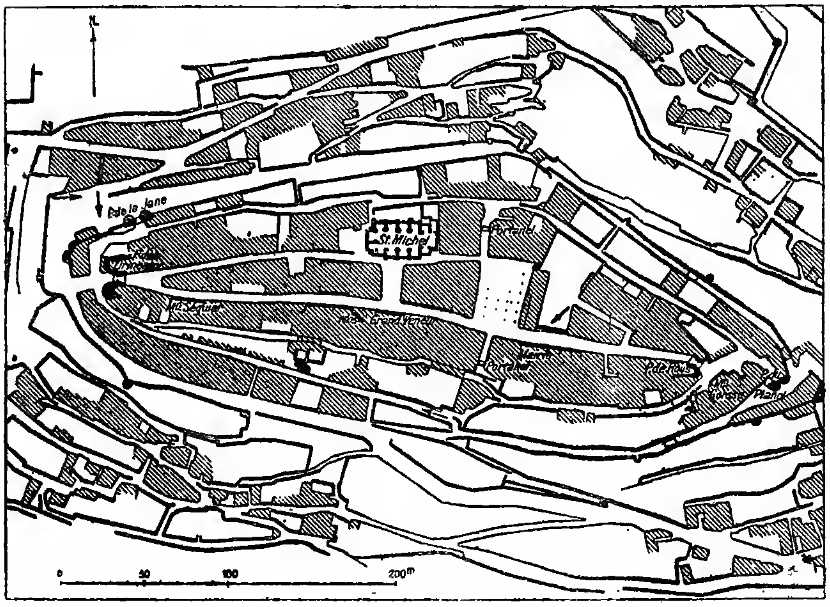
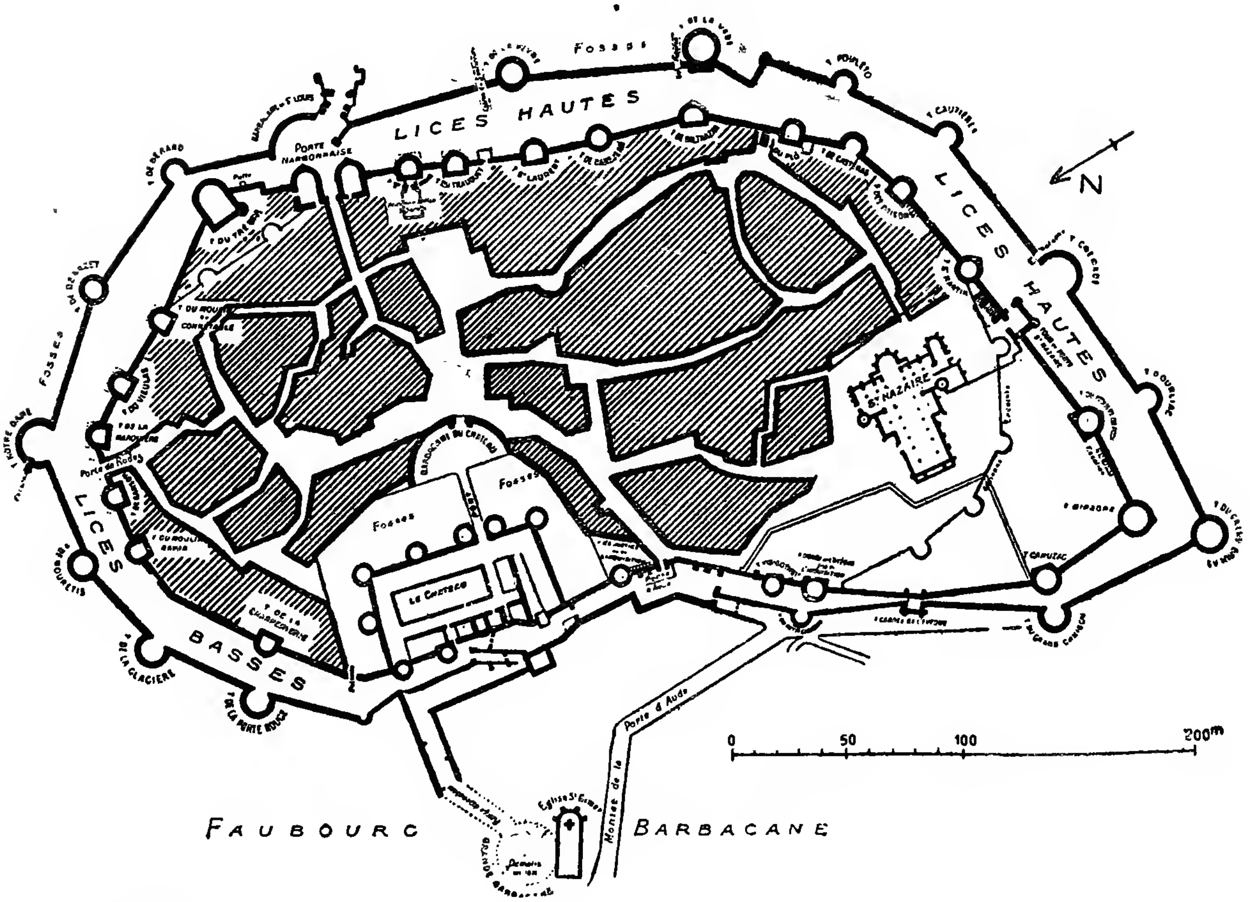
The majority of the cities that grew up as social life became gradually more settled owe nothing to the ideas of the Ancients on Town Planning; they vary in type, but as far as it is possible to generalise, we may regard them as growing up from small beginnings rather than having been deliberately laid out. They exhibit the merits and defects of such a development. The roads generally led to the main centres, the conformation of the site dictates the main lines at the start, the various demands of the community were adequately provided for. (See 11, 12, 13, and 14.) On the other hand there was but little looking ahead; the fact that it was possible to organise a communal life at all was much, and it is hardly to be expected that the subsequent developments of this could be anticipated; consequently the original scheme became inadequate, and by various makeshifts the cities adapted themselves to their new circumstances. One of the best of these was the provision of additional market places allotted to special businesses or trades and the consequent specialisation of business in various quarters, with their subsidiary centres, generally formed round the church of the district. The enlargement of the city was often difficult, especially after the fortification became so elaborate as almost to prohibit a remodelling. (See 15.) Gardens were built over, and apart from market places, streets, and alleys, hardly a scrap of ground was left uncovered, congestion becoming acute and the cities fell an easy prey to epidemic diseases.

At the same time these mediæval cities are remarkable for their beauty. How did this beauty arise? Camillo Sitte endeavoured to prove that it was due to careful consideration of the plan, but it may be doubted if this is true. We find that new cities laid out at this time, when the older ones were growing into beauty, display a simple



CORDES. 11



CARCASONNE. 12

rectangular arrangement. There is little inherently beautiful in the irregular mediæval town plans themselves; the beauty lies in the design of the buildings and in their exquisite adaptation to the peculiarities of their position. With a passionate interest in the city and its beautification, the instinct grew up for placing buildings to the best advantage and for so designing them that the accidental irregularities enhanced rather than diminished their effect. The plan was mainly accidental, the adaptation of the buildings to it was conscious and deliberate.

Indian Town Planning according to examples handed down was in theory rectilinear and generally rectangular, but exhibits variations in arrangement unknown to Greece or Rome. Notwithstanding this, the first impression of the Indian city at the present time suggests that its growth has been on the lines of the mediæval town, till a closer examination of the plan reveals the fact that the original scheme was more often deliberate and considered, and that the irregularities and distortions have arisen through the lapse of the controlling power. The main framework can still be traced, but encroachments and overcrowding have confused the plan of the central area while extensions have spread around it without any guidance and regulation. (See 16, also Chapter IX.)

Elsewhere in the Orient, in China for example, examples of Town Planning may be found even more closely approximating to the Roman type, but, as Professor F. Haverfield points out in "Ancient Town Planning," both plans being simple in character, we may quite well assume that they were arrived at independently.

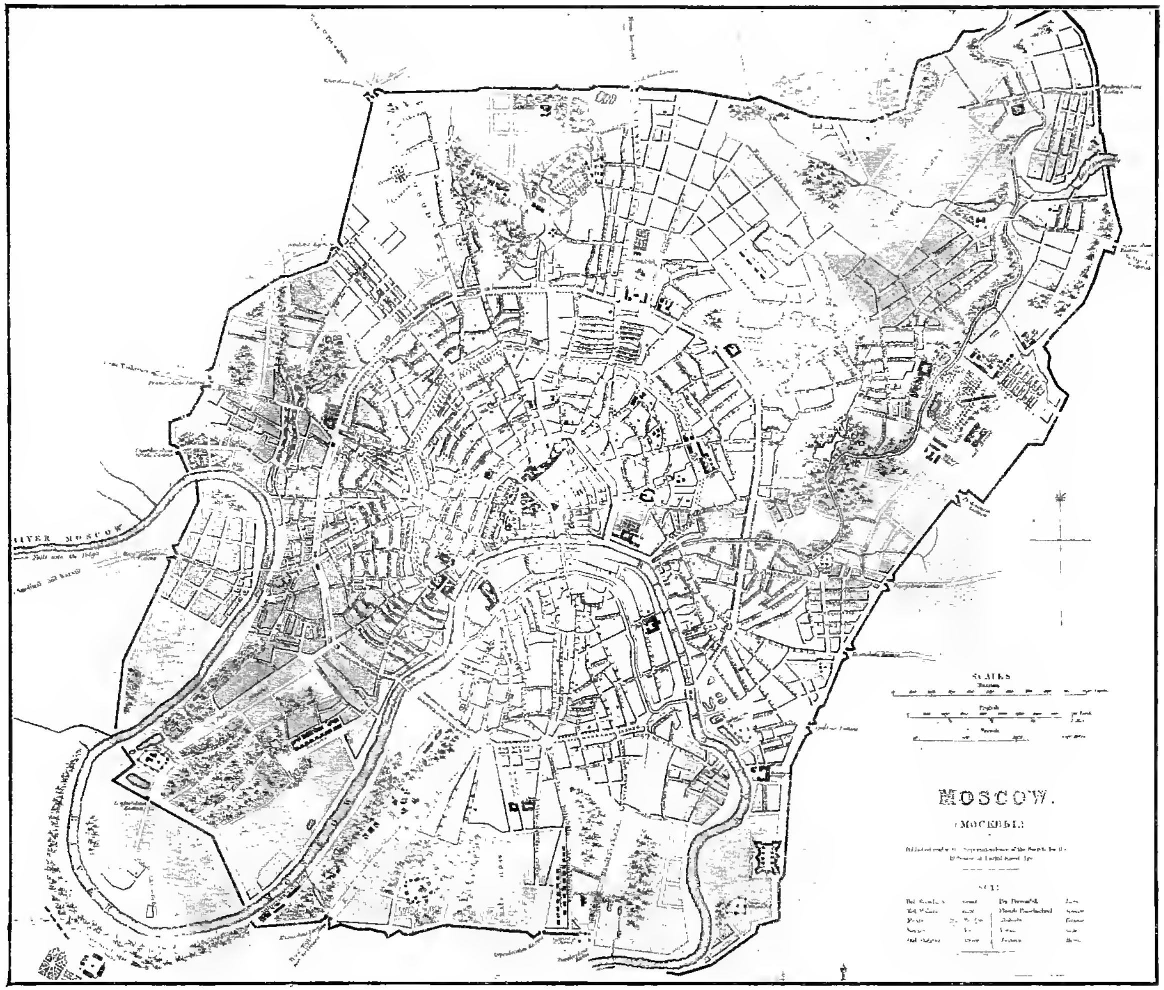
With the Renaissance a new spirit entered into civic ideals. The study of ancient buildings revived the taste for formal and symmetrical planning while the advances of scientific method led men to analyse the general principles of planning. That the value of the radial structure was recognised is shown by the diagram plan prepared by Perret de Chambéry and that for Palma Nuova (illustrations 17 and 18), while Leonardo da Vinci suggested the advantage of traffic routes on two levels, an idea to which the canalised cities, such as Venice and Amsterdam, most probably gave birth. Yet these studies remained to a large extent theoretical, and actual planning returned mainly to the rectangular system qualified by the use of circular forms and open spaces which are clearly suggested by the great buildings and forums of Rome (as illustrated in 19, with which may be compared 20 and 21.)

Among the exceptions may be cited the three great radials from the Piazza del Popolo in Rome, the extensions of Paris, the city of Karlsruhe, and later on L'Enfant's plan for Washington, while other cities developing under French influence display this radial method of planning. As has been suggested by Professor Abercrombie this type of plan was largely influenced by the practice of forming large hunting parks with rectilinear avenues and focal points as meeting places. Apart from the fact that many of these were quite close to the city, as adjuncts to a royal palace (see 21), the dignified formality of these imposing avenues could not fail to suggest to the rulers who employed them the idea of embellishing the city on similar lines.

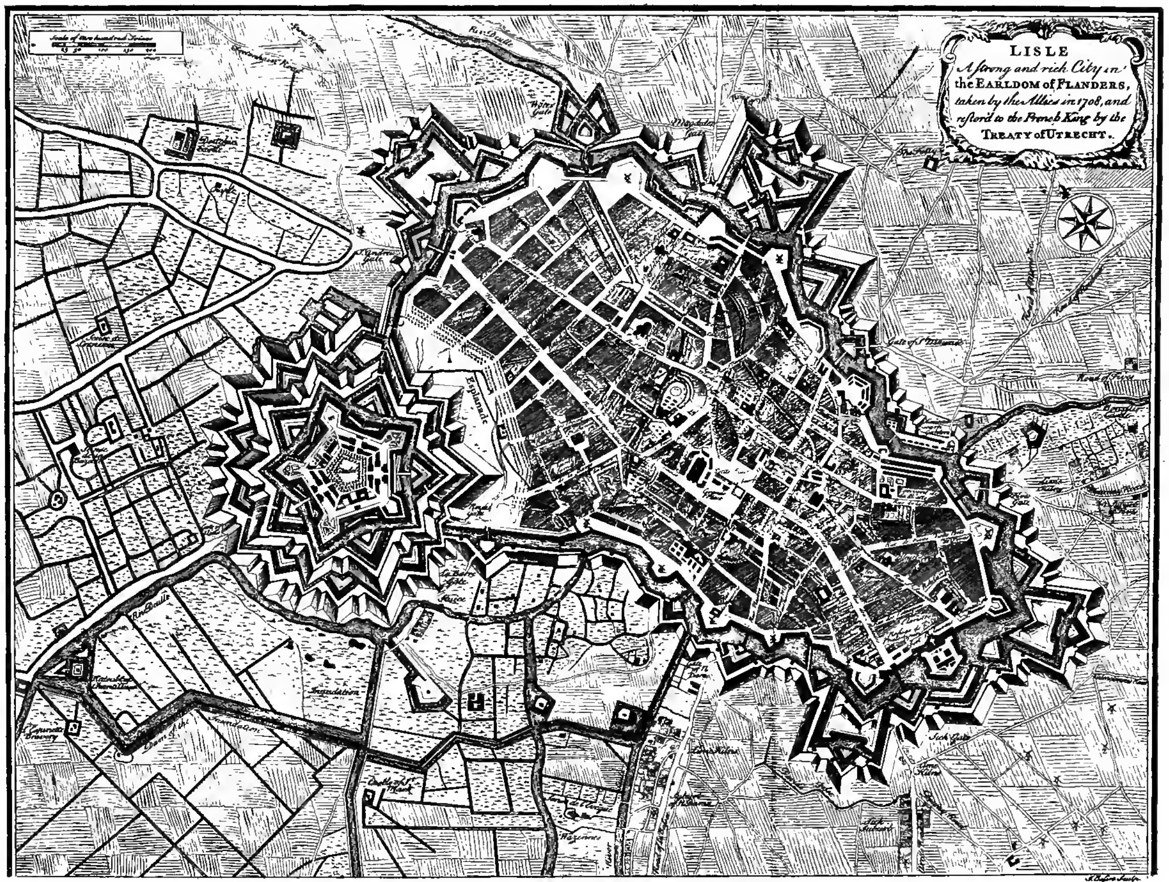
This introduced the problem of adapting these main radials to a subsidiary lay out meeting the requirements of rectangular buildings, and on a smaller scale the problem of designing buildings for other than rectangular sites.

Illustrations 20, 23, 24, and 25 give examples of various solutions of the first of these problems, while the second belongs to the domain of architecture rather than to that of Town Planning. The plan of Washington can hardly be called a solution, consisting, as it does, of the superimposition of radials on a rectangular plotting without adequate effort to reconcile the two. That for Detroit is more scientific in its basis; instead of employing radials an increased number of route directions is obtained by the combination of a rectangular with a triangulated system. Of course such a formal method is only suited to a level site like that of Detroit, and even here, in the scurry of

MEDIÆVAL PARIS

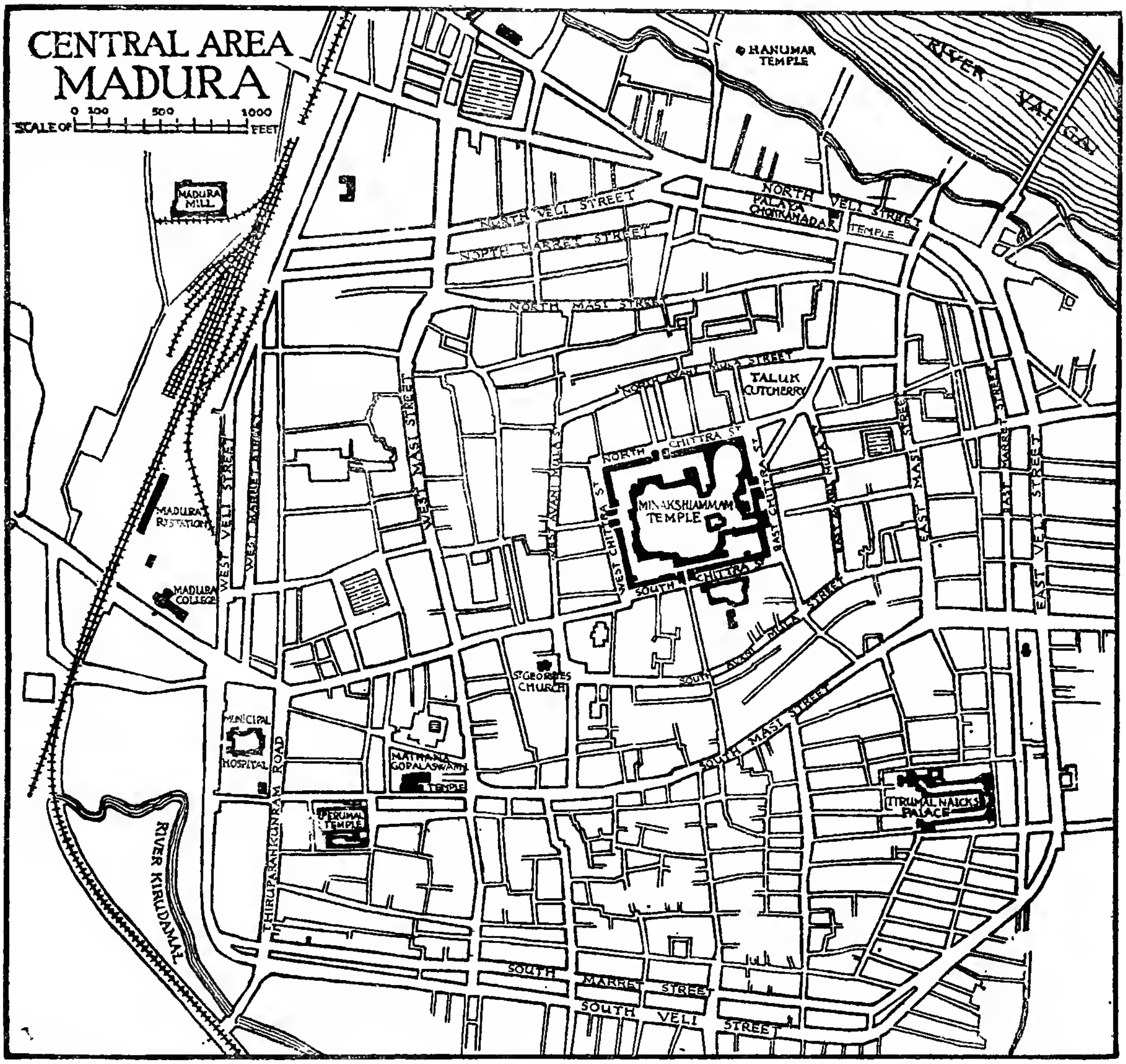


MOSCOW



PLAN of the CITY and CITADEL of LISLE.

For Mr. Tindal's Continuation of Mr. Rapin's History of England



MADURA, MADRAS. 16

rapid development, the plan was only partially carried out and soon lapsed into the ordinary rectangular plotting.

During the seventeenth and eighteenth centuries Town Planning was almost entirely on geometrical lines and the only variations from these were caused by marked natural irregularities. The plans were in all cases studied from an architectural standpoint and it was only in the nineteenth century that this point of view was forgotten and city extensions in England became "utilitarian" in the narrowest sense of the word. Sites were selected and covered with inferior dwellings as fast as possible (see Chapter I.) without regard to any of the principles on which the practice of Town Planning is based. Illustration 26 gives an example of this lack of method.

At the same time the formal tradition held on, both on the Continent, where the poorer classes were housed in blocks of building and not in small separate houses, and in England in areas allocated to the abodes of the wealthy.

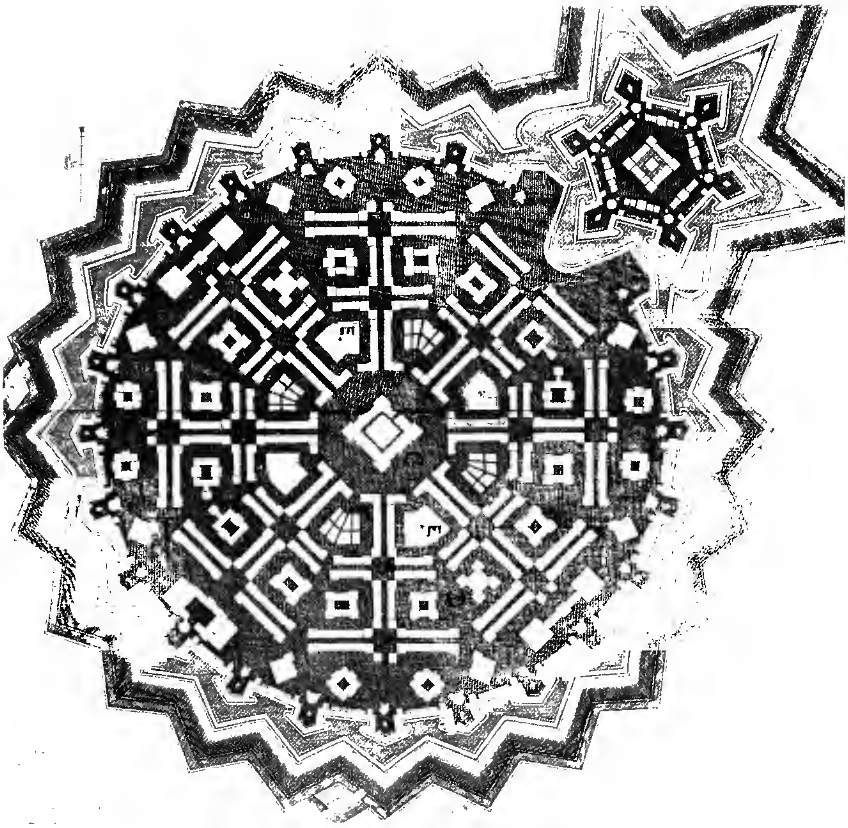
America took a different course, as while the exceptional increase in population and consequent growth of the cities gave no breathing time for considered schemes, land was in most cases comparatively cheap, so that towns could freely expand and the simple course of extending on uniformly rectangular lines was adopted. A few of the older towns, such as Boston, approximate more to the English type in showing unrelated patches of planning, but the rigid "gridiron" is almost everywhere prominent as the most expeditious method for handling areas not previously subdivided. Such was the obsession in favour of this practice that undulating districts which cried out for special treatment were cut up in the same mechanical way—a failing which may, however, be traced back as far as the early rectangular planning of the Greeks. (See plan of Philadelphia, 27.)

Towards the middle of the nineteenth century the influence of the "Landscape School" of gardening spread into the realm of Town Planning and the vogue for detached houses enabled the roads to be curved without interfering with building methods. In some areas this was a logical means of overcoming difficulties of level and avoiding steep hills, but curving roads became popular as a natural relief from a too pervading geometrical rigidity and were laid out for their own sake. (See 30.)

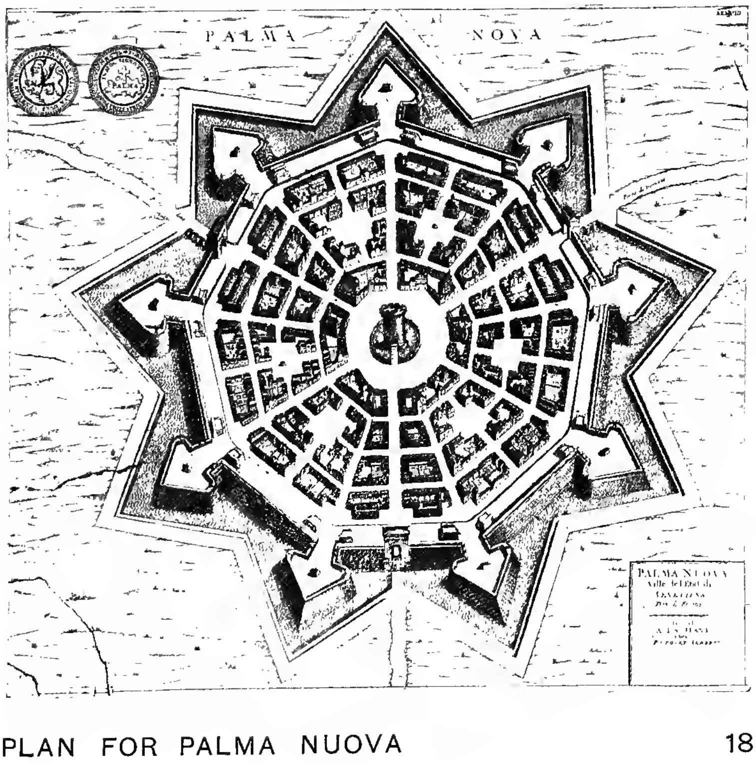
This development was not widespread and though "landscape gardening" extended through Northern Europe, it had but slight influence on Town Planning outside the British Isles. In Britain itself these views were on the wane during the later decades of the nineteenth century and the return to formal schemes was only somewhat qualified by a certain amount of freedom of method that remained as a legacy from the deliberate informality just abandoned.

A special feature of the Town Plan in many a European city is the result of the removal of obsolete fortifications. The earlier defences were simply a wall, or at most a wall and ditch, then bastions were added, so that the fortification was very similar to that around many Indian cities, but this stage was only a transitory one; the use of cannon demanded a more elaborate scheme and the system of the engineer Vauban came into general use in the seventeenth century, and so continued for some two hundred years. (See 15.) Fort St. George in Madras is, on a small scale, a good example of this method. In many cases a wide glacis or open space forms an essential feature of this form of protection.

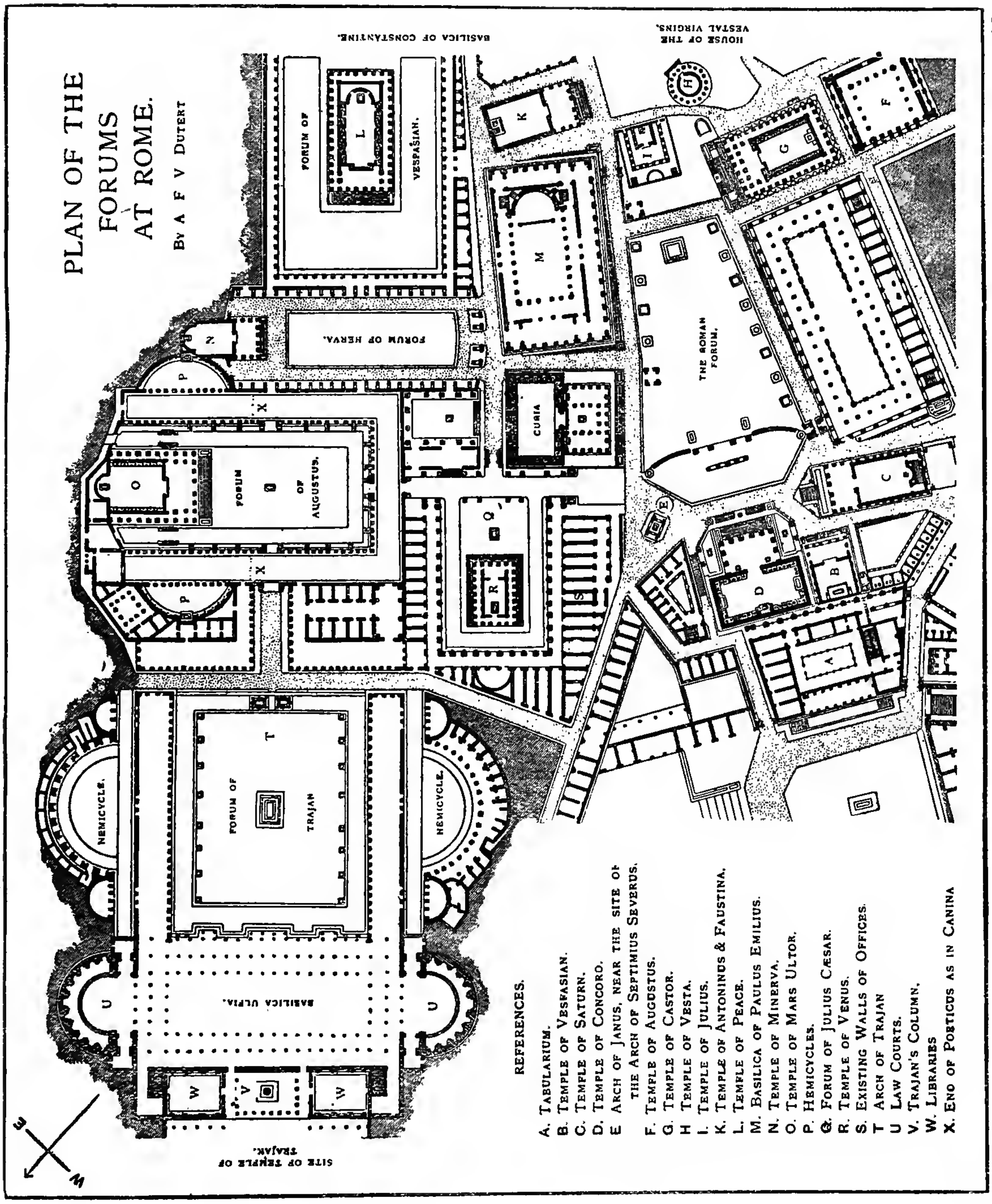
Now cities have often outgrown these lines of defence. The more primitive types did, it is true, leave their traces on the plan, but usually only to the extent of two lines of road, one within and one without the wall, the space being only occasionally converted into a boulevard. When, however, the later and more developed fortifications were cleared, either because of the growth of the city, or because, on account of revised methods of attack, they became obsolete, a wide space was left for development, and this



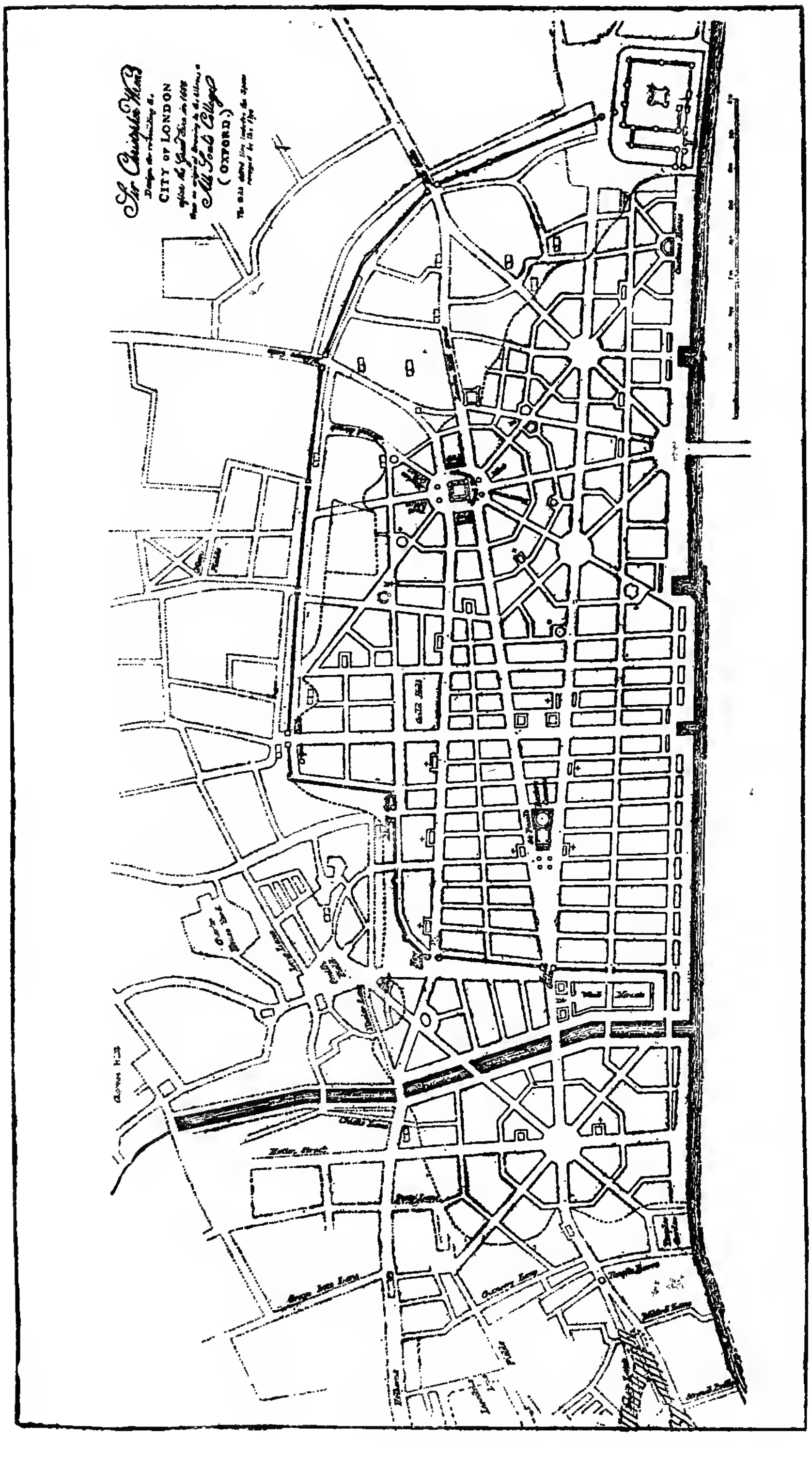
IDEAL CITY BY PERRET DE CHAMBERY 17



PLAN FOR PALMA NUOVA 18



ROMAN FORUMS. 19



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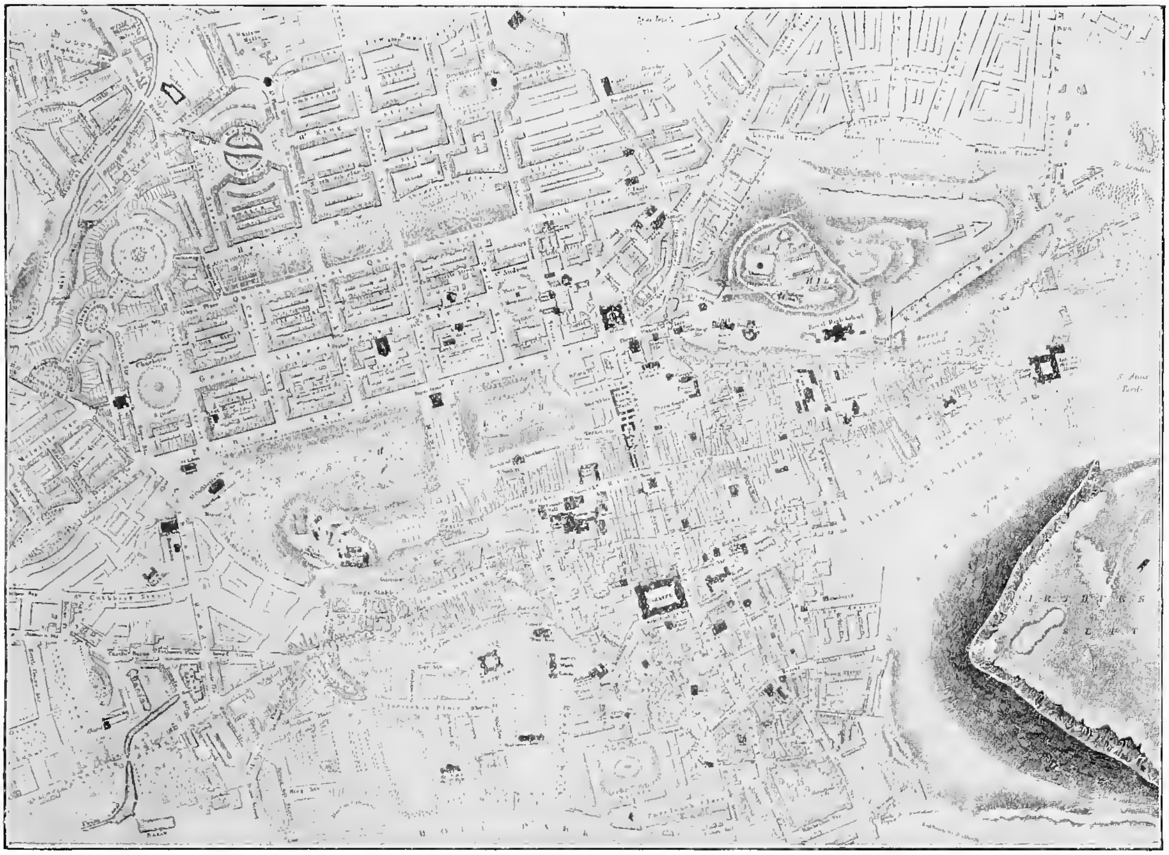
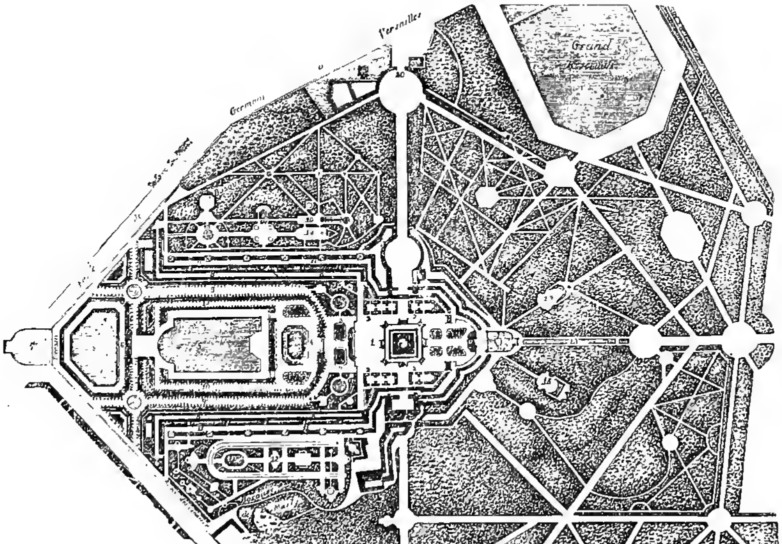
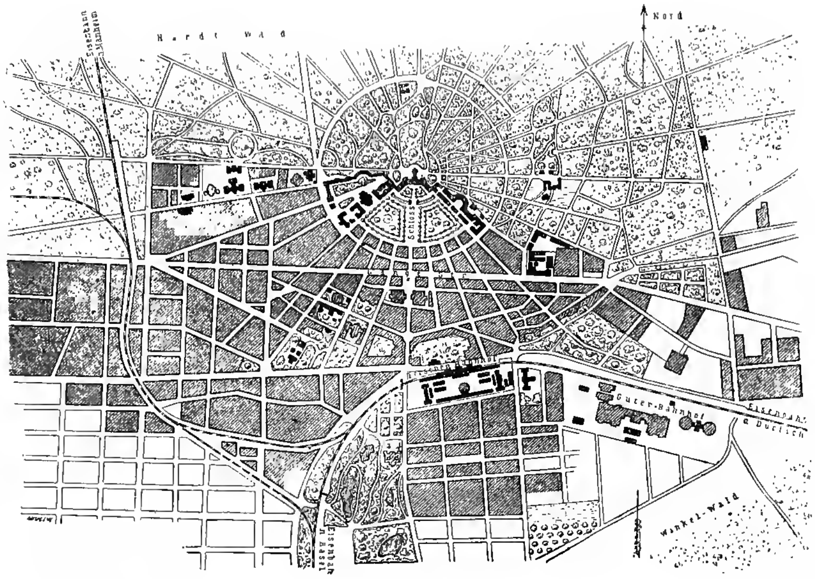
WREN'S PLAN FOR RE-BUILDING LONDON.



EDINBURGH 21

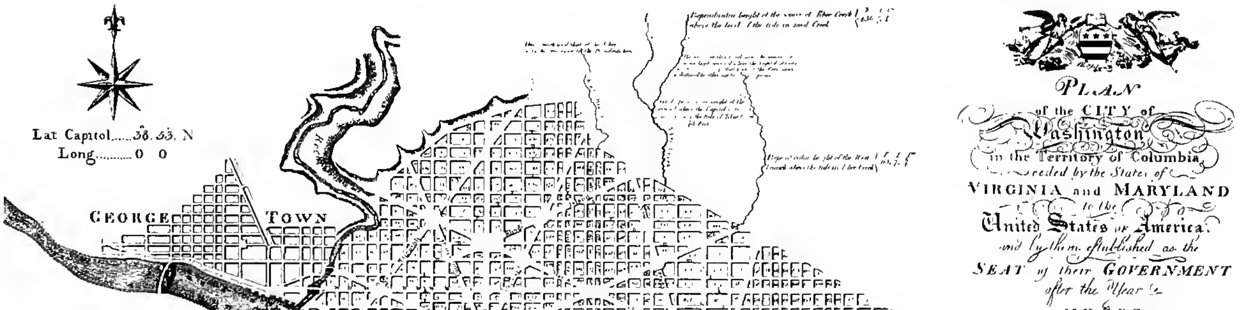


A FRENCH PARK 22



KARLSRUHE

23



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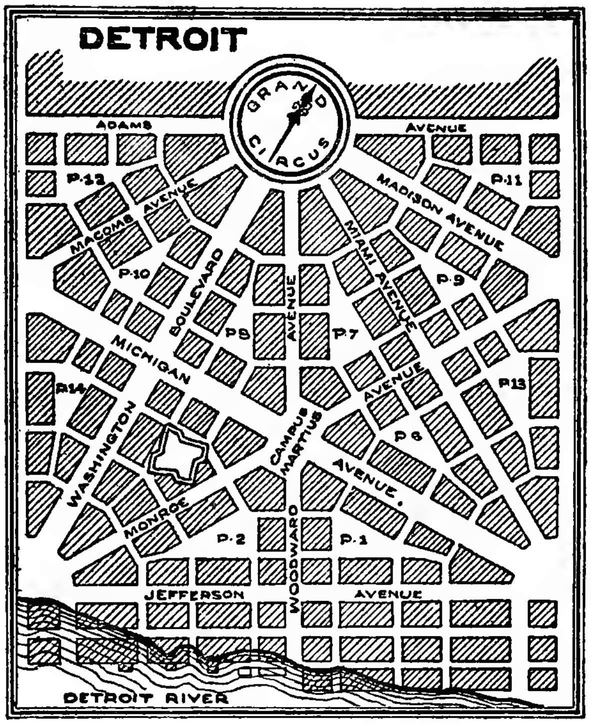
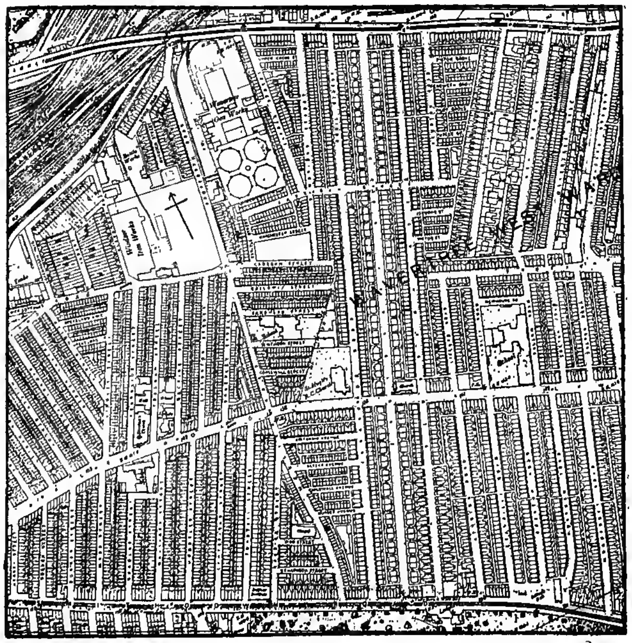
WASHINGTON

24



DETROIT 25



"UTILITARIAN" PLAN. 26

was usually devoted to an encircling boulevard with fringes of land that could be systematically laid out for building or as open spaces. Haussmann built up his Paris schemes on these rings (see 28), but perhaps the most notable example of this is the "Ring Strasse" at Vienna, where the fortifications were removed about 1857 and entire remodelling of their site took place. (See 29.)

Mention should be made of the effect of land ownership on Town Planning. We have already seen that in America large ownerships at low values has enabled the extensions to take a mechanically uniform direction.

In the British Isles the landowner usually holds a fair-sized area and has generally made himself responsible for a scheme suited to the development of his own estate without much consideration as to the adjacent ones, the owners of which are naturally in competition with him. This is not an ideal arrangement, as is shown by its results, but it put fewer difficulties in the way of town extension than that prevailing in many parts of Europe where the heirs divided and redivided the land until ownerships were so cut up that though suitable for cultivation it was impossible to utilise them profitably for building.

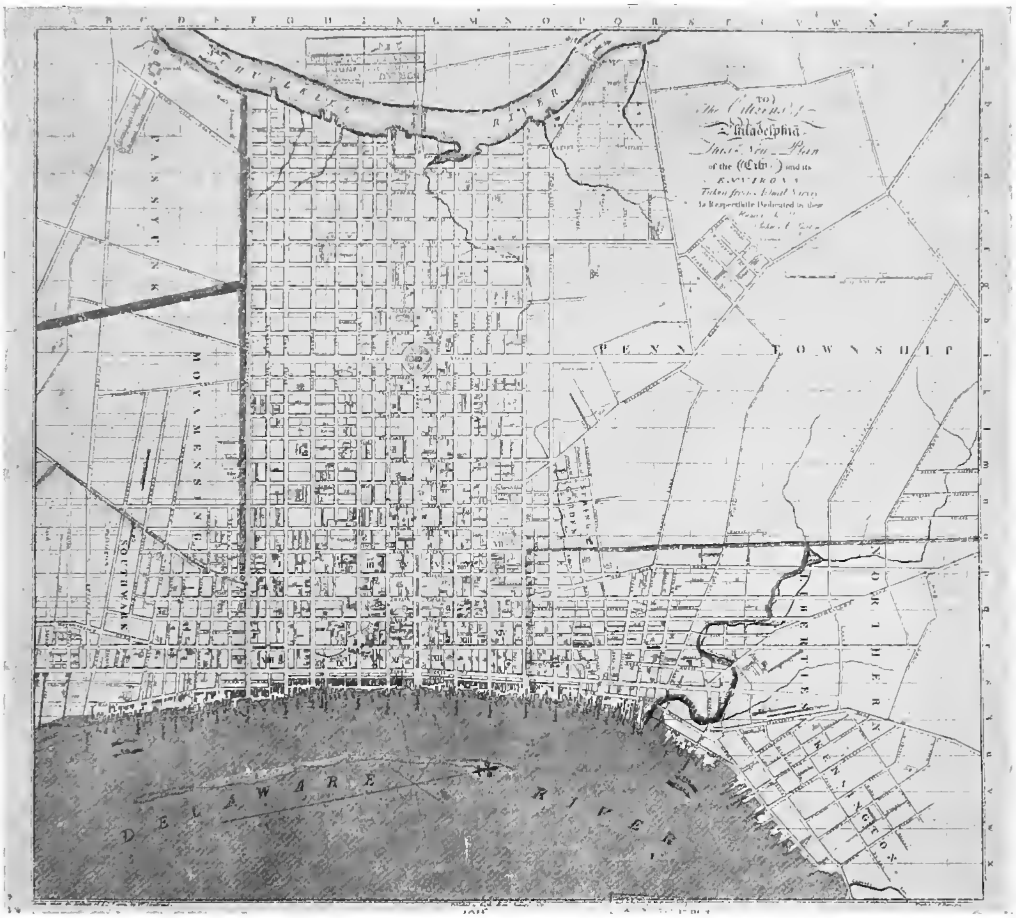
The results of this system were such that in many growing towns there was a genuine house famine, and steps had to be taken to secure areas of land suitable for housing. In Germany this led to the passing of the Lex Adickes giving powers to pool a number of these unsuitable areas, make roads, and return to the original owners plots proportionate in value to their former holdings, but in shape and situation suitable for building on. If this were not done building was either impossible or else only possible in forms likely to be wasteful and insanitary, such as we see in the later periods of the Middle Ages, when strips of garden were occupied by narrow lanes and closely-packed dwellings.

The Lex Adickes brought town development into the hands of those best qualified to handle it, and made easier the steps toward a systematic study of civic problems.

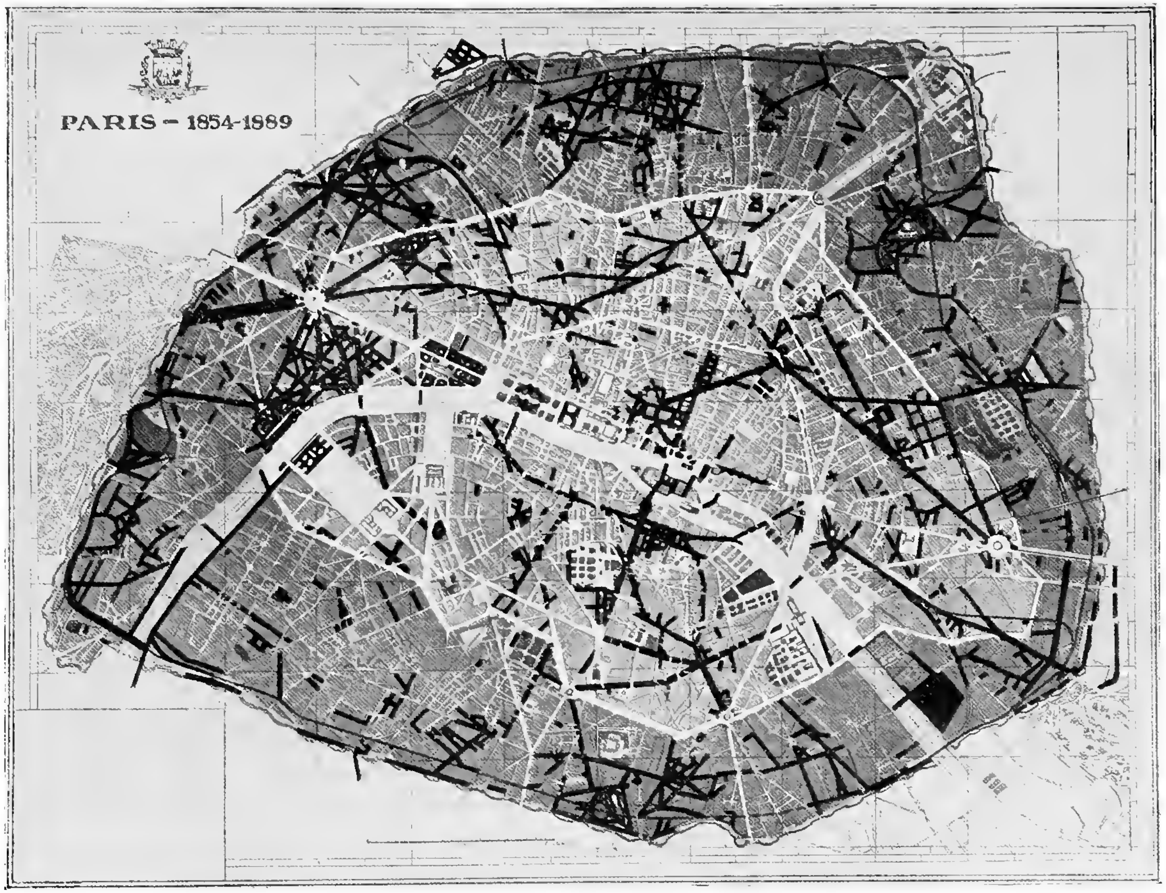
We now reach a point where Town Planning arrives at a new stage. Up to within the last half century it had been based on considerations frequently artistic, but rarely and only accidentally sociological. Of late, we have been gradually reaching the conclusion that sociology is the principal basis for Town Planning, hence the necessity for a civic survey analysing all the influences that dictate the city's structure and governing its development. By this means it is hoped to arrive at a just balance between the demands of the various factors that make for the best forms of civic life. Too often in the past one aspect has been allowed to dominate the others.

Now the broad general view demanded by Town Planning practice must be based on a comprehensive knowledge of the city's requirements, present and probable, coupled with a grasp of how these requirements may best be provided for. This involves careful study of the habits and needs of the citizen from the various aspects cited in the survey, in order that life and its activities may be carried on under the most favourable conditions possible. The methods and results will vary according to circumstances, but will entail a systematic organising of civic resources and a regulation of the manner and purpose for which the various portions of the city should be employed.

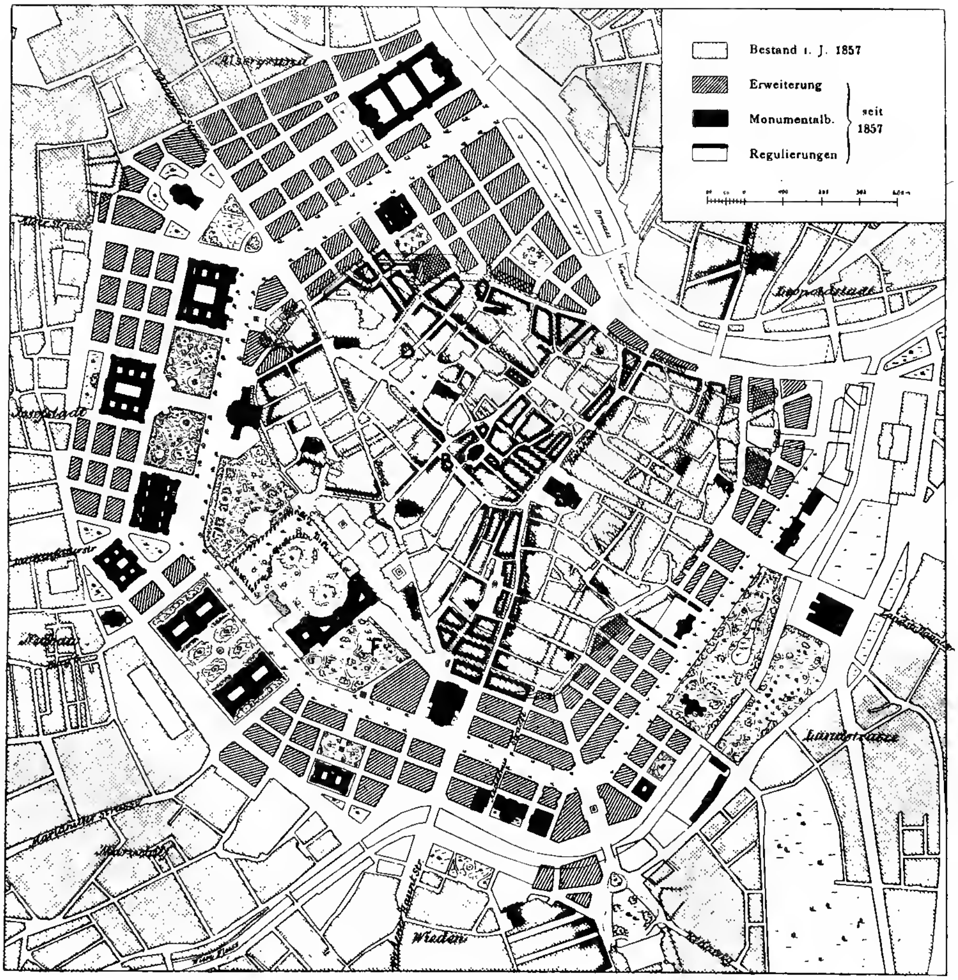
Thus, starting with what already exists it has to be decided what should be retained, what improved, and what eliminated. Then follow the modifications, substitutions, and extensions which must be made for the purposes of recreation, health, commerce, traffic, education, etc.; by the provision and treatment of open spaces, the services for the sick and infirm; allocation of areas for commercial and manufacturing purposes; the improvement and formation of roads, railways, canals, and their corelation; the proper distribution of schools and other educational institutions; and all other matters that affect the welfare of the community.



PHILADELPHIA



PARIS, HAUSSMANN'S IMPROVEMENTS 28

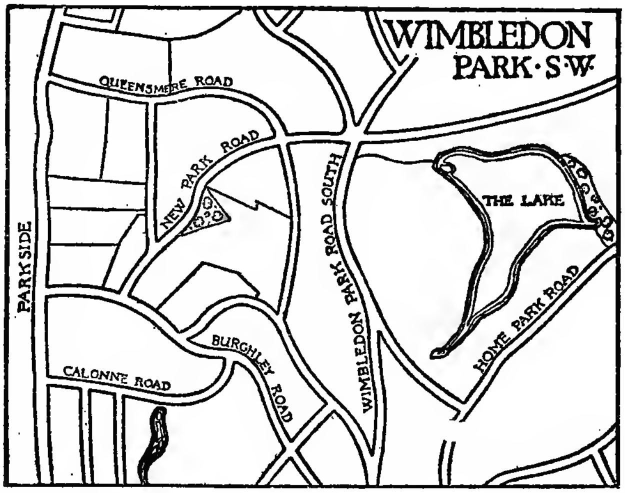


THE RINGSTRASSE, VIENNA

It is also necessary to frame regulations to ensure that development is appropriate to the conditions. Not hard and fast rules to be applied automatically, but skilfully varied ones, according to circumstances, by which streets are proportioned to the traffic, open spaces to the number of houses, trades prevented from becoming objectionable, and in general, areas and facilities employed to the best advantage.

Under such regulations we may find limitations of the area and the heights of buildings, prohibitions in respect of use, rules as to methods of construction, and all that formerly came under the head of municipal by-laws, with the difference that they are varied instead of uniform, and that as far as possible reason and common sense take the place of mechanical uniformity.

So much for the purely scientific side of modern Town Planning, but it goes further than this: its ideal is to take all that is best in the traditions of the city, all that is best in the customs of the past, all that is best in existing methods, and to frame a scheme which shall give to the community the utmost inducement towards reaching a higher and fuller life in all its varied aspects.



WIMBLEDON. 30

Chapter III.

THE CIVIC SURVEY.

Before a municipality is qualified to prepare a Town-Planning Scheme of at all a comprehensive character it is absolutely necessary that it should be in possession of all the essential facts concerning the town as a whole, and it is at the same time desirable that these facts should be set forth in an easily comprehensible form. Moreover it is not only advantageous to the work of the official that these preparatory studies should be made, they are also of no less service to the citizen in general as stimulating his interest in the place wherein he dwells.

These studies are entitled "The Civic Survey" and their object is thus twofold, firstly as a guide to the work of those in charge of municipal improvement and development, and secondly, in the form of a civic museum, to arouse the interest of the townspeople.

Quoting from the report of the Sociological Society on the dangers of Town-Planning Before Town Survey, we read :—

"What will be the procedure of any community of which the local authorities have not as yet adequately recognised the need of the full previous consideration implied by this survey and exhibition ? It may simply remit to its City Engineer instructions to draw up the Town-Planning Scheme.

"This will be done after a fashion. But few officials have as yet had time or opportunity to follow the Town-Planning movement even in its literature, much less to know it at first hand, from the successes and blunders of other cities. Nor do they always possess the many-sided preparation—geographic, economic, artistic, etc.—which is required for this most complex of architectural problems, one implying moreover innumerable social ones.

"No doubt, if the plan thus individually prepared be so positively bad, in whole or in part, that its defects can be seen by those not specially acquainted with the particular town or with the quarter in question, the Supervising Authority can disapprove or modify. But even accepting what can be thus done at a distance or even from a brief visit from an advisory officer, the real danger remains. Not that of streets, etc., absurdly wrong perhaps, but of the *low standard* of the mass of municipal art.

"Town-Planning Schemes produced under this too simple and too rapid procedure may thus escape rejection rather than fulfil the spirit and aims of its Act; and will thus commit their towns for a time, or even irreparably, to designs the coming generation may deplore. Some individual designs will no doubt be excellent, but there are not as yet many skilled town-planners among us.

"Passable Town-Planning Schemes may be obtained without this preliminary Survey and Exhibition, which we desire to see in each town and city; but the best possible cannot be accepted.

From the confused growth of the recent industrial past, we tend to be as yet easily contented with any improvement; this, however, will not long satisfy us, and still less our successors. This Act seeks to open a new and better era, and to render possible cities which may again be beautiful. It proceeds from Housing to Town (Extension) Planning, and it thus raises inevitably before each municipality the question of Town-Planning at its best—in fact, of City Development and City Design. No single scheme of survey can be drawn up so as to be equally applicable in detail to all towns

alike. Yet unity of method is necessary for clearness, indispensable for comparison; and after the careful study of schemes prepared for particular towns and cities, the Sociological Society is agreed upon a general outline, applicable to all towns, and easily elaborated and adapted in detail to the individuality of each town or city. It is therefore appended, as suitable for general purposes, and primarily for that preliminary survey previous to the preparation of a Town-Planning scheme which is the first and last recommendation of this Committee.

" The survey necessary for the adequate preparation of a Town-Planning Scheme involves the collection of detailed information upon the following heads. Such information should be as far as possible in graphic form, *i.e.*, expressed in maps and plans, and illustrated by drawings, photographs, engravings, etc., with statistical summaries, and with the necessary descriptive text; and thus suitable for Exhibition in Town House, Museum, or Library, or, when possible, in the City's Art Galleries."

This refers to Europe. Madras has but few Art galleries at present, though we may hope for some in the future.

The following general outline of the main headings of such an enquiry admits of adaptation and extension to suit the individuality and special conditions of each town and city.

Situation, Topography and Natural Advantages :—

(*a*) Geology, Climate, Water Supply, etc.
(*b*) Soils with Vegetation, Animal Life, etc.
(*c*) River or Sea Fisheries.
(*d*) Access to Nature (Sea Coast, etc.)

Means of Communication, Land and Water.

(*a*) Natural and Historic.
(*b*) Present State.
(*c*) Anticipated Developments.

Industries, Manufactures and Commerce.

(*a*) Native Industries.
(*b*) Manufactures.
(*c*) Commerce, etc.
(*d*) Anticipated Developments.

Population.

(*a*) Movement.
(*b*) Occupations.
(*c*) Health.
(*d*) Density.
(*e*) Distribution of Well-Being (Family Conditions, etc,)
(*f*) Education and Culture Agencies.
(*g*) Anticipated requirements.

Town Conditions.

(*a*) Historical :—Phase by Phase, from Origins onward. Material Survivals and Associations.
(*b*) Recent :—Particularly since 1839 Survey, Time indicating Areas, Lines of Growth and Expansion, and Local Changes under moderate conditions, *e.g.*, of Streets, Open Spaces, Amenity, etc.
(*c*) Local Government Areas (Municipal, Parochial, etc.)

(*d*) PRESENT :—Existing Town Plans, in general and detail.
Streets and Boulevards.
Open Spaces, Parks, etc.
Internal Communications, etc.
Water, Drainage, Lighting, Electricity, etc.
Housing and Sanitation (of localities in detail).
Existing Activities towards Civic Betterment, both Municipal and Private.

Town-Planning ; Suggestions and Designs.

(*A*) Examples from other Towns and Cities, British and Foreign.

(*B*) Contributions and Suggestions towards Town-Planning Scheme, as regards :—
(*a*) Areas.
(*b*) Possibilities of Town Expansion (Suburbs, etc.).
(*c*) Possibilities of City Improvement and Development.
(*d*) Suggested Treatments of these in detail (alternative when possible).

This in February 1911 was the programme of the Sociological Society. Since then other methods of sub-division have suggested themselves, not so much as theoretical improvements but mainly for practical convenience in the sub-division of the work.

Now we know that it is more generally convenient to leave out suggestions for the future from the survey programme. The Sociological Society suggested anticipated developments and anticipated requirements and also proposed suggestions towards town-planning Schemes and other items of that kind. It is better, however, to keep the survey clearly to a survey of what exists, and to a comparative study as between one city and another, leaving for separate attention any suggestions as to the future which the information embodied in that survey brings to the mind.

In the detailed programme dealt with here it will be noted that future proposals are not embodied. We must limit ourselves to getting a clear idea of the state of the town up to the moment at which the survey is made.

A considerable amount of survey work has been carried out under programmes that have mostly been somewhat tentative and experimental in character, the main headings of which have been varied according to the objects aimed at.

With the knowledge of these efforts the International Committee of Civic Art, situated at the Hague, has drawn up the following schedule which may conveniently be adopted as the basis of our future work :—

General Topography	A
History and Archæology	B
Traffic	C
Growth and Development	D
Housing	E
Recreation	F
Garden Cities and Suburbs	G
Education	H
Art	J
Environment	K
Structural Methods	L
Hygiene	M
Economies	N
Law and Custom	O
Administration	P

Even this list may not be found fully comprehensive, and it is quite possible that

other groups will need be added from time to time. We may, however, regard it as a suitable scheme for our present work and deal with its sections in detail.

The original programme involves a great deal of cross classification and repetition. It has been simplified, following more closely the lines on which our previous studies have been carried on.

By adopting the international classification we shall assist the general progress of this work, but as the details are only put forward in a tentative form there can be no harm in reserving the right to simplify and re-arrange these, as has been done in this revision.

A (General Topography) includes the preparation of :—

1. A Geological Map.
2. A Contoured Map. (See map M.I. of Madras.)
3. A map showing the nature of the soil.
4. A map showing the original character of the area.
5. Diagrams showing the climate: (*a*) seasonal temperature, (*b*) rainfall, (*c*) prevailing winds, (*d*) evaporation, etc.
6. Map of water areas, &c.: (*a*) sea and tidal water, (*b*) rivers with volume, (*c*) lakes, tanks and reservoirs, (*d*) levels of ground water.
7. Maps showing the utilisation of surface either natural as forests and wastes, or artificial as buildings, cultivation, etc.
8. Maps showing the sites of mines and allied activities.
9. A map showing areas fully irrigated, partially irrigated, and dry land.
10. Zoological map, distribution of animals.
11. Ethnographical map.
12. Political record with maps.

B (History and Archæology): Historical studies should include :—

1. A plan showing by varied tintings or hatchings the extent of the city at various past dates.
2. Plan showing variations in the arrangement and features of the city in the past, such as lines of fortification, water courses, tanks, etc.
3. Notes and diagrams as to periods of stagnation or development with reason for same.
4. Old maps and views, or copies of these, should be collected and arranged in order of date.
   Reference should be made to those in existing collections.
5. Particulars of popular and religious festivals.
6. Particulars of special customs, ancient and existing, in the locality.

Archæological studies should include :—

7. A map showing the position of all structures and sites of archæological interest tinted in accordance with the date to which they belong and numbered for reference.
8. Plans, photographs, and particulars of the structures and sites numbered above with references to sources from which further information could be obtained.
9. Names of present owner and occupier, details of past and present use, alterations and restorations, etc.

C (Traffic) deals with traffic statistics, the volume of traffic being shown on plans by the width of the line traced along the routes. (See illustration 31.)

1. Railways: (*a*) tonnage of goods, (*b*) number of passengers, fares, and time by zone maps. No. 2. Tramways, similarly with fares and time on zone maps.
3. Road vehicles (estimated by units).

4. Road pedestrians.
   Road vehicles should be reduced to a common denomination both on the basis of the degree of obstruction caused and on that of the value of the vehicle with its load. (See Chapter VII.)
5. Waterways.
6. Notes and drawings should show the construction of roads and other traffic routes.
7. The adequacy or otherwise of existing traffic routes should be dealt with.
8. Special consideration should be given to road intersections and all points where traffic difficulties arise.
9. Illustrated descriptions of bridges classified according to purpose and type of construction. These should also be considered from the æsthetic point of view especially as to their harmony with the surroundings. (See also Section J.)
10. Railway stations and other adjuncts to transport should be similarly dealt with.
11. Vehicles and other plant should be studied in relation to traffic requirements.

D (Growth and development) comprises the following studies :—
1. Plans of typical cities showing the lines on which they have developed.
2. Plans showing the functional grouping of civic life and the tendencies towards the formation of centres and quarters.
3. Graphic illustrations and maps showing density of population at various times, and in various areas. (See map M. IV.)
4. Plans and diagrams showing how 3 has been influenced by considerations of commerce, transit, etc.

E (Housing) deals with dwellings under the following heads :—
1. A plan showing residential areas classified according to type of house.
2. Illustrations showing types of housing referred to in 1 such as (*a*) block dwellings, (*b*) terrace, (*c*) semi-detached, (*d*) detached houses, further graded as necessary according to size.
3. A plan showing areas occupied by houses of an undesirable character.
4. Plans showing the zones of distance between residential areas and public institutions as schools, libraries, baths, parks, etc.
5. Plans showing the cost of building in various areas.
6. Plans and diagrams showing the cost of the public services, rates, lighting, power, etc., in various areas.
7. Plans and diagrams showing cost of living in various areas.
8. Zone plans showing time taken to reach city centres from residential areas.
9. Zone plans showing cost of transit from these areas to city centre.
10. Studies in social methods, co-operative housing and living, and kindred activities.

F (Recreation) deals with open spaces under the following heads :—
1. Parks, commons, reservations, public recreation grounds, etc., the areas of which should be coloured green on a general plan.
2. Private or semi-private recreation areas shown on plan in a lighter tint of green.
3. Permanent open spaces as cemeteries, reservoirs, etc., not available for recreation shown in sage green.
4. Waste and unemployed land casually used for recreation coloured grey.
   Origin, history, characteristics, and utilisation of these open spaces, as a guide to the principles to be followed in regard to laying out same.
   Proportions of population that take part in various exercises or games.
5. Promenades and avenues.

This section also deals with buildings for recreation and shows on a plan—

6. Public buildings for entertainment.
7. Libraries.
8. Baths.
9. Private places of entertainment.

History, character, leading features, accommodation, etc. Diagrams should show graphically the number of visitors annually and seasonally, in classes 1 to 9.

G (Garden Suburbs and Cities) treats of :—

1. The advantages and disadvantages of this method of development.
2. The financial systems on which it may be organised.
3. The planning and organisation.

Illustrations may be drawn from examples at present existing.

The suburb and the city would be kept distinct as involving different guiding factors.

H (Education) may commence by showing on plan the following :—

1.	(*a*)	Elementary schools (provided)	coloured	red
	(*b*)	„ „ (non-provided)	„	brown
	(*c*)	Secondary „	„	orange
	(*d*)	Private „	„	blue
	(*e*)	Boarding „	„	green
	(*f*)	University college and technical institutes for specialised teaching	„	purple

2. The plans should be accompanied by statistics graphically expressed as to number of scholars, the areas from which they are drawn, their playgrounds, etc.
3. Diagrams showing the provision of school accommodation relatively to the density of population.
4. Studies in the character of school buildings and the accommodation they are designed to afford.
5. Plans, etc., showing educational institutions supplementary to schools, as libraries, museums, lecture and concert halls, gymnasia, etc.
6. Notes as to progress, physique, and circumstances of students.
7. Teaching methods, scholarships, and further studies co-relating to other sections.
8. Notes as to subsequent careers of students as related to the education they have received.

J (Art) relates to artistic problems in connection with civic design.

1. Questions relating to the effect of the city as a whole.
2. Questions of scale, mass, skyline, solids and voids, as contributing to general harmony of effect.
3. The relations between the city structure and natural beauty.
4. The embellishment of the city, monuments, accessories, etc.
5. The co-operation of the various arts.
6. The influence of structural methods on artistic expression.
7. Educative influences promoting appreciation of the arts.

K (Environment) is substantially a localised study on the lines of section A dealing with the protection of all that is best in the natural surroundings of a city—

1. From a social and scientific point of view.
2. From the historical aspect.
3. From the standpoint of beauty.

These cover the considerations with regard to the preservation of typical scenes, buildings, villages, etc.

L (Structural Methods) deals with the influence of materials and constructive traditions on the appearance of the city; it comprises :—

1. Illustrative studies of past and present uses of materials and methods of construction.
2. Economic factors dictating these.
3. Materials used in construction of roads, bridges, etc.
4. Materials used for buildings and their embellishment.
5. Materials employed for accessories as road and rail vehicles, fittings, etc.

M (Hygiene) deals with the following :—

1. Climatic influences (diagrams).
2. Considerations of site, soil, etc., by plans showing soil, levels, natural drainage, etc.
3. Vital statistics past and present.
   - (*a*) Maps showing density of population. (Refer to section D.)
   - (*b*) ,, ,, Death rate. (See map M. V.)
   - (*c*) ,, ,, Zymotic death rate.
   - (*d*) ,, ,, Infant death rate (per 1,000 born. See map M. VI.)
   - (*e*) ,, ,, Birth rate.
   - (*f*) ,, ,, Areas specially affected by epidemics.

   In each case an average of five years may be taken, and the city may be subdivided.
4. Diagrams illustrating physique.
5. ,, showing proportions of misdemeanour and crime.
6. Provision of infirmaries, hospitals, prisons, etc., shown on plans with accommodation in proportion to population served.
   For the infirm.
   For disease.
   For mental deficiencies.
   For epidemics.
   For criminals.
7. Diagrams showing cubic amount of building and heights of buildings in relation to health.
8. Building regulations and their effect on health.
9. Sanitation, sewerage and scavenging.
10. Condition of buildings.
11. Disposal of the dead, cemeteries and crematoriums.
12. Other services affecting health.

N (Economics). This section appears somewhat inadvisedly to have been limited to communal activities; it should obviously have a more extended scope comprising the following, illustrated by plans and diagrams :—

1. Industries of city and district.
   - (*a*) Large factories.
   - (*b*) Small ,,
   - (*c*) Home industries.
2. Transport.
   - (*a*) Import and distribution.
   - (*b*) Collection and export.
   - (*c*) Personal locomotion.

3. Wages in relation to housing and purchasing power.
4. Public accommodation and services.
5. Land cultivation.
6. Comparative studies of decaying and expanding industries.
7. Seasonal and intermittent employment.
8. Diagrams of unemployment in trades by the week and year.
9. Methods of financial control.
10. The value of land in various zones or areas. (See map M. VII.)

O (Law and custom) deals with :—

1. General regulations for towns.
2. Rules for Town Planning.
3. The relation between the laws of the land and local enactments.
4. The laws relating to the protection of
   - (*a*) Historic monuments.
   - (*b*) Natural objects, flora and fauna.
   - (*c*) Open spaces and rights of way.
   - (*d*) Health and conditions of labour.
5. Conditions of public employment.
6. Systems of franchise.
7. Religions and religious observances.
8. General and local customs and habits of life.

P (Administration) deals with the methods of control employed in respect to communal services :—

1. The governing bodies for
   - (*a*) The municipal services.
   - (*b*) The judicial ,,
   - (*c*) The hygienic ,,
   - (*d*) Educational ,,
   - (*e*) Other official ,,
   - (*f*) Regulation of commerce.
   - (*g*) Religious and philanthropic bodies.

   Including the method of appointment to these; whether they are compulsory or voluntary, etc.
2. Cost of various administrative services and how these costs are met.

These sections having been drawn up in view of European conditions fail to cover the whole ground demanded in the examination of an Indian city, and though they might be expanded to meet both cases it is preferable to supplement them by a few remarks on the extension of these studies needful to meet the special demands that India makes on the civic Survey. In section A it has been possible to include these (see maps M. I. & II. of Madras), but in others such as D, E, and N, Indian conditions are more complex and require special investigation.

For example, occupations are more localised and are grouped in definite areas, so that it is necessary to prepare a map indicating the location or locations of these occupations. In the city of Madras no less than 33 occupations can claim distinct positions in the city area, and here as elsewhere many of these have a number of recognised centres of activity (see map M. III.).

The following is a list of the occupations so located :—

1. Dhobies.
2. Dyers.
3. Earthworkers (oddars, etc.).
4. Fishermen (karayars).
5. Goldsmiths.
6. Leatherworkers.
7. Lime-kiln workers.
8. Oil-mongers.
9. Paddy-boilers.
10. Scavengers.
11. Toddy-drawers (shanars).
12. Weavers.
13. Bricklayers.
14. Brass and copper workers.
15. Bamboo basket makers.
16. Palm ,, ,,
17. Cotton spinners.
18. Carpenters.
19. Painters.
20. Potters.
21. Rope makers.
22. Stone masons.
23. Tailors.
24. Barbers.
25. Embroiderers.
26. Carpet-makers.
27. Bidi makers.
28. Electro-platers.
29. Prostitutes.
30. Professional beggars.
31. Domestic servants.
32. Agriculturists.
33. Butchers.

Then again it is desirable to have a map showing the distribution of the population both racially and by castes. This in its simplest form may be plotted under the following heads :—

A. Brahmins.
B. Other Hindus.
C. Musalmans.
D. Eurasians.
E. Europeans.

(See map M. II. of Madras).

Much more detailed subdivision will, however, often be desirable according to the character of the occupants of the city to be dealt with.

The specialisation of markets, etc., has been referred to elsewhere, but in this also India displays a more decided tendency towards specialisation than Europe. The following list is fairly representative :—

Markets for animal food.
,, ,, vegetables.
,, ,, grains.
,, ,, timber.
,, ,, fuel.
,, ,, leather.
Slaughter houses for cattle.
,, ,, ,, sheep.
,, ,, ,, pigs.

It will thus be seen that India demands, owing to its national characteristics, some expansion in the scope of this preliminary survey of conditions—and that these expansions deal with matters of vital importance. This will make it clear that such surveys are not to be regarded as based on any hard and fast schedule, but that such schedules are to be considered solely as suggestions, to guard against omissions, and in no way dictating exactly the course to be followed in each case, or defining the relative importance of the various sections of the investigation.

Chapter IV.

ECONOMIC STUDIES.

All demands arise primarily from economic need. Even the governing machine that dominates the character of the capital city is a part of the national economy, and the recreative functions of the holiday watering place can also be brought under the same heading. For, after all, it is but a fraction of the great productive machine that is engaged on the bare necessities of life, and once you pass beyond these there is no stopping place at which one can pause and say " this is " or " is not, a luxury." Hence the fulfilment of any legitimate demand may be included within the range of economic effort.

An attempt to classify our activities must therefore rest on some other ground than the distinction between an economic and a non-economic purpose, since between these no clear and definite line can be drawn.

There have been several attempts to define the character of the city under various heads, but such classifications, whatever their historic value, are difficult to utilise at the present time, owing to the fact that the majority of our important cities fulfil varied rather than uniform functions.

There are still a few university cities which may be classed under the head " educational," but even these include in their scope the functions of a local collecting and distributing centre. There are a number of small country towns owing their existence to the latter functions alone, but it is only a proportion of coast and inland watering places that claim to exist for one purpose only, and they are generally more or less extensions of a manufacturing or commercial centre.

Perhaps in India there is hardly an equivalent to what are termed " watering places," where people reside or spend their holidays solely for the purpose of recreation or for the benefit of their health, and these are the only kind of cities that can be claimed to exist for one purpose only.

The best course in attempting to realise the purpose of the city is to summarise its history. In the most primitive state of civilisation the small community is based on the need for co-operative effort in dealing with the means of livelihood. Man early found out that by combination he could get a more comfortable time than if he hunted or cultivated alone. Within this early community, the variation in human faculty is bound to result in a certain amount of exchange and barter. One man finds he is more skilful at one thing than at another. We find the fisherman, the herdsman, and the woodman. Professor Geddes has developed a very interesting thesis on the subject of these variations of occupation and the way in which they initiate commerce and interchange under the more primitive conditions of life. It may be seen that this local bartering would be followed by trade relations between one community and another, according to the natural advantages peculiar to different localities. Then follows rivalry in wealth and power, bringing in its train the desire for domination and the appeal sometimes to force of arms. Many hold the view that a large proportion of the world's fighting, in common with its other activities, has been inspired by economic difficulties, and it is certainly true that these same influences may be the ultimate arbiters as to whether war shall commence or cease.

A useful illustration will be found in the section of Professor Geddes' comparative exhibition of cities dealing with mediæval times, where the illustrations range from the earlier city mainly engaged in communal activities and with but slight protection

(see illustrations 11 & 13), to the later ones in which so large a proportion of the activity is consumed in the preparations for defence, as to result in a relatively squalid standard of life. The houses are packed together too closely and an altogether disproportionate amount of civic activity is devoted to guarding against war and the attacks that were liable to take place during the later mediæval times. (See illustration 15.)

Though perhaps it is rather outside the scope of our subject to consider the place of war in the world's economy, it must be pointed out as a fortunate circumstance for our future towns, that warlike operations of military value no longer concern themselves so definitely with the actual city area as they did up to recent years, and we are thus able to disregard the encircling defence in our schemes. Encircling defences were troublesome factors in the cities of the Middle Ages and even more so recently.

Coming back to the city as a mart for the exchange of goods, we are able to trace how it also became a centre for the exercise of crafts, thus foreshadowing the manufacturing town of to-day.

The activities of exchange lead to the skilled craftsman coming into the city, as the place where he could find the best market for his wares. The city's demands foster higher standards of craftmanship; we know that in larger cities the work in times past has been of a comparatively high standard as compared with the work in smaller and less important places.

As a collecting and distributing agency the town gathers raw or partially raw material, and the advantages of co-operation in converting many classes of produce to their ultimate purpose located this kind of work in the city. In using the term raw material a certain latitude may be assumed, a pedantically accurate definition not being necessary for our present purposes. Roughly speaking, raw material comprises the animal, vegetable, or mineral products of the earth when they have passed the first stage in the operations towards their utilisation. Animals when reared or captured, vegetables when grown and cut, minerals when "won." Transport is not usually regarded as a stage. Thus coal whether at the pit head or delivered might be regarded equally as raw material.

In considering the relationship between this stage of production and our towns we find only in mineral wealth a definitely locating influence, all other productions being too diffused to make use of the city except as a collecting and distributing agency. Thus our main interest in investigating the utility of a city will generally be its function as a mart or as a factory.

Now with regard to old-established cities, their utility in these respects has, we may assume, been established by experiment. But for some definite advantages over other locations they would not exist, and though they may have been assisted or hampered by good or bad methods of management this has only affected their position to a minor extent.

It may be thought that the same policy of "laisser faire" is the right one to apply to new or rapidly developing towns, lest any interference might result in arbitrarily restricting commercial activities. The only justification for this view would be the incompetence of the controlling body.

The science of city planning has, we may claim, now reached a stage that should disarm any distrust as to the possibility of forecasting on general lines the best form of development in any particular case. It need not be inferred from this statement that there will be no mistakes in detail or that the men selected will always prove competent to their task, but it may be accepted that if the right type of body is charged

with the determination of the structural lines of a developing city, the result arrived at will be immeasurably superior, from both the economic and social points of view, to the usual haphazard results of a " laisser faire " policy.

One may qualify this to some extent, insisting on the fact that these results can only be achieved by the most thorough survey work and the most thorough comprehension of all those factors and functions of the city, but the proper course is to examine the city rather than leave it to chance of circumstances. It should be pointed out that no prudent man starts a commercial enterprise without carefully considering his programme from every side as to costs and results. And again the state methods of investigation, although usually limited to matters affecting fiscal policy, do give some guidance in a similar direction.

It is but an extension of this principle to require that municipalities shall take a similar course in respect to the interests under their control. Since the development of the city is so largely an economic question it follows that this is also fundamental in the case of the city survey.

Now, as soon as we begin to examine the city from this point of view we find that it is impossible to divide our work into sections cut off from each other by a hard and fast line, but some classification being necessary for the sake of clearness, we may find it convenient to begin with the values of land and the reasons for these values, as pointing the way to some comprehension of the general economic structure.

At this point we must keep clearly in our minds this fact, that the survey deals only with the existing state of affairs and takes a definite account of these ; suggestions and proposals are outside its scope, and come in at a later stage. Now we find areas in the city employed for various purposes, and their values depending on their peculiar suitability or otherwise to the purpose for which they are employed.

The following may be suggested as a rough schedule of the uses of town areas :—

1. Manufacturing.
   (*a*) Large factories.
   (*b*) Small factories.
   (*c*) Home industries.
2. Transport.
   (*a*) Import and distribution.
   (*b*) Collection and export.
   (*c*) Personal locomotion.
3. Housing in relation to earnings.
4. Public accommodation.
5. Land cultivation.

Each of these demands further consideration.

Thus in the case of manufacturing premises, we have first the large factory demanding its special transport and housing schemes ; next the smaller factory which cannot claim any of these special requirements ; and lastly, we have the home with its home industries, the single family at work, a method which is of course highly developed in India. Now take transport. We have the various methods of transport involving traffic by rail, by tramway, road, water, all requiring a certain amount of separate study, and as indicated above we can put each of these into these three classes. As regards import and distribution, we can take as a typical case the city's food supply. The city gathers from all the surrounding country and even distant places food and produce. These are brought in, and there must be some sort of method—it may be a good one or a bad one—there must be a method in which these are gathered into the

cities, and then handled and redistributed through the areas of the city, because every citizen requires food, and most of this food will be produced outside the city.

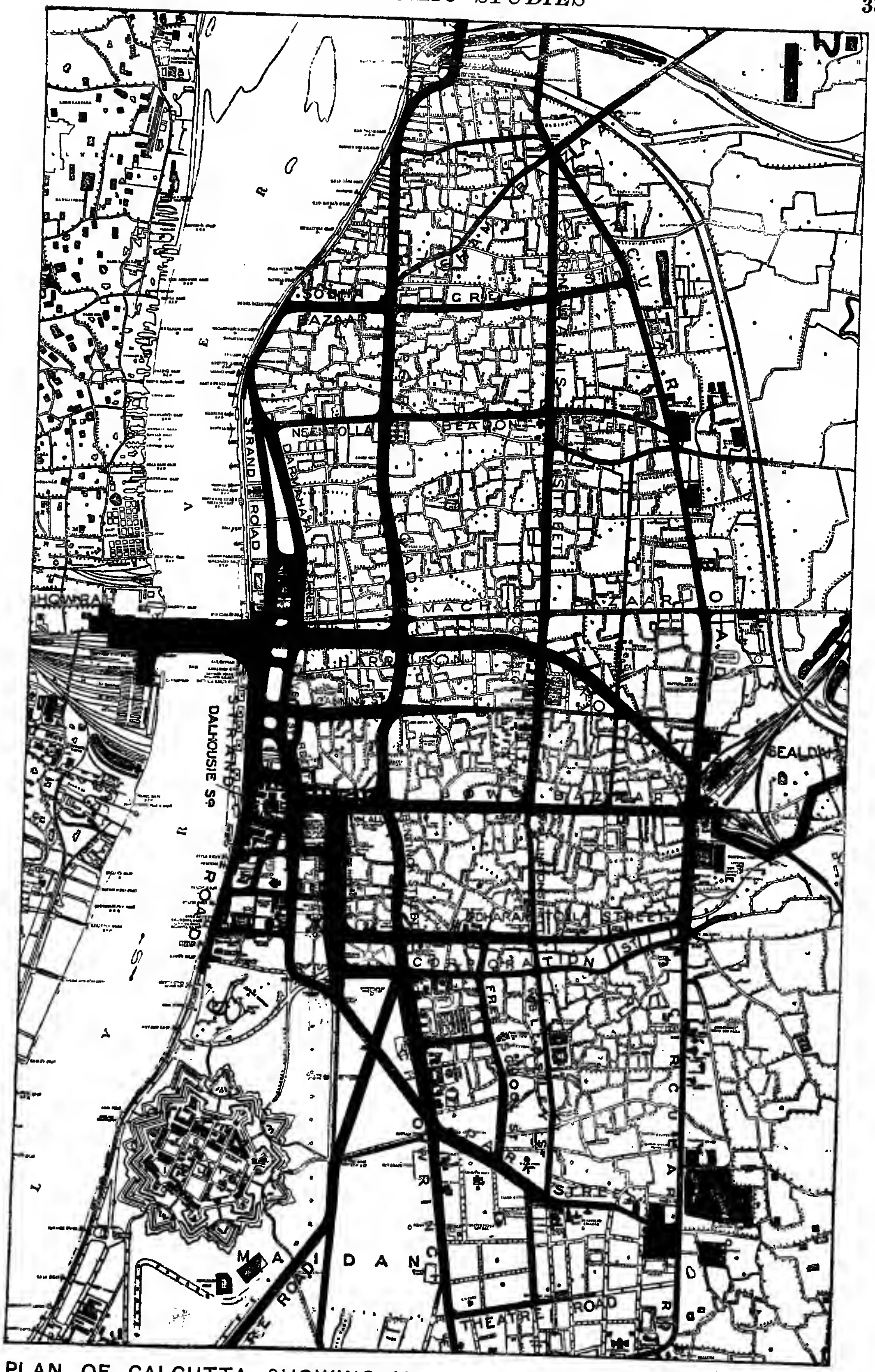
Then we come to the question of collection and export. The city has some method by which it pays for the things brought in, it pays by manufactured goods or some other services. The raw material is not only brought in; it is handled in the city either by big factories or by small industries, or by one man or another, and then it has to be gathered up and sent out to wherever it finds a market. There is one other type of transport, that providing for personal locomotion. The larger the city the greater the amount of organisation required to move people from one point to another. With regard to Indian cities, this is a constantly growing tendency. This kind of personal locomotion is a safety-valve for other difficulties, the difficulties of housing and congestion, and by its means we are able both to remedy defects of city structure and to gain more latitude in our methods of lay-out for the future.

Then we come to wages and housing. This is not the place to deal with the numerous types of housing, but it will be recognised that intricate economic studies are involved in the employment of small houses, of flats and big blocks, not to speak of the social side with which we are not dealing at the present moment. There is a very definite economic study in the amount of land required, the amount of people to be placed on a given area, and all the questions connected with housing and which have of course an influence on wages.

Then with regard to public accommodation, we have such diverse accommodation as places of worship, educational buildings, open spaces for recreation, administrative buildings—like town halls, municipal offices, and police courts—and then services such as water, lighting and sewerage. These things have also their economic factors. It may be asked why land cultivation is included in our schedules, but it should be observed that agricultural industries in close proximity to the city area are important factors in the life of the city and demand to be taken account of. As a side issue, there is a little matter which requires looking into, namely, the arrangement by which agricultural land in India has to pay the full municipal taxes as soon as it is included in the city area; it is, therefore unfair to include any considerable area within the municipal boundaries, unless a reduction in the rate of taxation is made. This practice hampers the municipalities very much when they come to arrange extension schemes. Is it not possible to include larger areas by making some concession in the matter of taxation when land is employed for purely agricultural purposes ?

Passing on to the next point, it must be borne in mind that it is the purpose of the economic survey to record the productive efficiency of the city, but let us not forget that the results arrived at under this head must not be regarded as definitely valid and conclusive until they have been reviewed in the light of ethical, hygienic and other important considerations. Let us get our economic survey, and then consider other things as well and to co-relate it with these.

With this reservation we may proceed. Having gathered, tabulated and plotted all the information hinted at in the preceding schedule, we shall possess plans and diagrams of the city, showing the purposes for which its various areas are used, their values for the uses to which they are put (see maps M. II, III, & VII. of Madras), the volume of traffic of all kinds passing from one point to another (see illustration 31), the costs of transport by different methods, the definite or indefinite allocation of area to purpose, the wages earned by the inhabitants, the proportion spent on housing, the cost of the public services and other information requisite to give a clear view of the economic conditions on which the well-being of the city rests. In case of roads, for example, we know how highly important it is that the road area of the cities should be



PLAN OF CALCUTTA, SHOWING VOLUME OF TRAFFIC
From Mr. E. P. Richards' Report.

so arranged as to give the maximum value for the amount allotted for this purpose. By this means, you get the minimum of upkeep and the maximum of results.

Then we must also remember that the results arrived at are merely relative ; they must be regarded with those of other cities before they can be clearly appreciated. As an example of the use of comparisons, one city may have an obvious advantage over another in respect to the importation of some material they both use. Why then are not all the factories centred there ? Perhaps we may find if they are not, that it is more remote from the consumers it supplies and that the balance is struck in this way, or perhaps that its situation is inferior as regards supplies, so that wages are consequently higher.

There are any number of such factors as these, and all having their bearing on the possibility or otherwise of a town development of one kind or another. The well informed municipality with all the knowledge at its disposal will be able to calculate possibilities in a way most advantageous to the community it controls. The manner in which towns have been made or unmade by circumstances is an interesting chapter of history and one especially suitable for perusal by municipal officers. With this knowledge they may be able to guide their town to prosperity, or at the worst to save it from disaster.

It may be felt, perhaps, that these studies appear somewhat vague and inconclusive ; but the further they are carried the more they will unfold, until as one approaches a comprehensive grasp of the economic interdependence of the whole city organism, the less it is possible to resist the fascination of mastering every detail.

Chapter V.

TRADITION AND CITY DEVELOPMENT

It seems rather superfluous that in India one should need to discuss tradition, because it may be supposed that if there is any country in which tradition is respected, that country is India. Still there have been signs that the Indian tradition has lost ground; and perhaps it is just as well we should be reminded, that though perhaps some traditions do not seem directly applicable to the present conditions, tradition is a thing which should, as far as possible, be respected. There are many new things operating in India, and you will find that traditions do have application to these new things if they can be interpreted; but they do require some interpretation which has not hitherto been attempted. The old conditions were governed, and probably governed fairly and effectively, by the old traditions; but the old traditions must be expanded and developed to meet an entirely new state of affairs.

It must not be forgotten that the outward and material appearance of a city is the natural outcome and expression of life and ideas under which it has developed. The value of its tradition is consequently measurable by the value of the part it has taken in the history of human development.

A city which has rather an important past is likely to have sentimental and material traditions far transcending those of any city that has been comparatively obscure.

In appraising this value we must beware of taking too narrow a view, of forming our opinions too closely on the ideals of the moment. Such ideals are perpetually re-constituting themselves, forming new combinations, by the advance and retirement of their leading components, as in a complex dance movement. Thus it is impossible at a given moment to place comparative values on the influences that have governed the form of this or that city, as we lack a reliable standard for our comparisons. Of course, we all have our individual preferences, one for the acute mentality of the Greek, others for the dominant forces of Rome, the vivid life of the Middle Ages, the dignity of the Renaissance, and perhaps even the despised "industrial age" may in future take its turn in exercising the fascination of a period when ideas and methods differed from our own.

Let us not forget those useful guides—the artists, pictorial and literary. The things that have inspired them—how varied and multifarious they are—from the subtle line of chiselled marble to the sombre masses of smoke-blackened kilns; from the ordered beauty of the Italian garden to the accidents of form and mass in warehouses, derricks, and smoke shafts.

We have, and rightly, the feeling that we ourselves have something to say in the development of the city, that with the recognition of a higher sense of communal life must come a more consistent and more definite manner for its expression; but let us not, on the other hand, condemn without the most careful consideration the efforts that are perhaps a little too near us to have acquired the dignity of age, lest we fall into the hands of the fashion mongers, who are ever too ready to exploit the craving for novelty and would persuade us that nothing can be so good as the method of the hour.

The supply of really imaginative work is limited in any age, and most assuredly the present one cannot claim to be exceptionally prolific in this respect. It is, therefore, all the more important that the traditions both remote and comparatively recent should be respected, and that nothing should be obliterated unless we are very sure that we can substitute something better.

Seniores priores. Let us give the old city first place and see what claims it has on us. Has it passed its zenith, or is it still approaching it, either by steady progression or after a series of fluctuations ?

No historical detail should escape notice in our dealings with the city that lays claim to a past. In cases where no great development can be anticipated the obvious course is to maintain the existing character, in so far as it is compatible with modern modes of life. We may not sacrifice the health or legitimate needs of the citizen in the interests of archæology, but the conflict between the two is far less acute than many are apt to imagine. Far more often the conflict is between defective taste and the claims of the past than between these claims and any actually genuine social demands.

In the city that has come down to us as a heritage from our ancestors without material increase in size, our main duty is to secure that the inevitable additions and modifications shall affect its character as little as possible.

With the old city that is developing the problems is more complex. It will probably present features belonging to different stages of its development, which, while imperfectly harmonised, nevertheless have a value in marking the phases of growth, and we shall be compelled to strike a balance between their claims and those of modern requirements if we are to secure a consistent harmony throughout.

There are in all old-established centres a few features or structures that will be regarded as inviolate, but there are many more which it may be highly desirable to retain, subject to the proviso that their retention does not militate too greatly against the convenience or amenity of the city as a whole.

Again, the city being the result of this series of phases of development, the question arises, is it not the natural thing to go to work independently of the past, and add yet another phase based on the exact requirements of our own day ? Such a course looks so logical and simple that it seems almost a pity to have to refuse its acceptance. These exact requirements are, however, a fiction, all requirements being in small measure material and in far larger measure psychological, and this latter factor would be, in the ideal community, materially influenced by continuity of tradition.

In former days, when travel was less universal and the builder was little influenced by work outside his own town, it was only natural that the style of building should develop progressively and gradually from one manner to the next. Now that these conditions are changed, there is a much greater liability to a breaking down of these traditions and the importation of exotic methods.

Now, one of our chief difficulties lies in the fact that transportation facilities have changed the natural building materials in many districts. We cannot afford to disregard the economic aspect of building; in most cases we are pledged to give the maximum convenience within our means, using brick where we should formerly have employed stone and other substitutions of a like character. As each material demands appropriate treatment, this adds a further difficulty to the task of harmonising the old with the new, yet with study and care a great deal can be done in the way of harmonising the general forms and colour schemes, even where different materials have to be used.

In the present day the purpose of artistic expression takes a small place in the interest of the community. To many this may be an unpalatable fact, but it is none the less true. The exceptional advances made of late in the application of scientific knowledge to material requirements must be paid for, and part of the price appears to be a certain degree of stagnation in other fields of activity, more especially in those arts having form and space as their basis.

Just let me remind you that history confirms this view. The Greeks achieved remarkable artistic results. All their arts were highly developed. Rome came along, and Rome turned its activities in other directions, and produced great engineers, great

organisers, and great conquerors. But art under the Romans—not science, for construction was very much advanced—the art of expression in beauty, in form, and colour came to a standstill or even retrograded. Then amid the less organised Middle Ages, art once more rose up and took a dominant place in the activities of the people. Art in the Middle Ages was paramount in the minds of the people. Later on it once more retrograded and economic and other activities reappeared. At the present day we are at one of those periods where art is merely, as it were, a sort of amusement, not very thoroughly understood, and the activities of the best brains seem to be directed, as far as possible, into other directions. Of course there are always a few men whose brains will only work in some special course, and among them are the artists of the present day, but art is not a dominating influence with the human race as a whole. It is being suppressed for the moment by other activities. This may be deplored, but the fact remains. The human race seems, as a rule, only capable of putting one form of activity to the forefront at any particular moment; and whatever form this activity takes must predominate at the expense of others.

It is therefore all the more important that we should endeavour to maintain and pass on the traditions of periods more expert in these methods of expression than our own, awaiting patiently from generation to generation the time when the inevitable turn of the wheel which bring these activities once more into a prominent place in the human economy.

So far we have dealt mainly with building, and it may be assumed there is reason for believing that any attempt widely departing from local traditions is unlikely to be satisfactory; but the art of civic development comprises many other things besides the buildings themselves. There is the framing up, as it were, and here we have again the task of reconciling new requirements with old, in a more accentuated form, probably, than in the case of structures themselves.

As the result of this modification in our demands the extensions to our cities usually assume a more rural aspect than anyone would have regarded as possible some years ago. We recognise that at this moment there is a distinct movement both in England and in India to give more space and far more garden to the new extensions of a city than has been customary in times past.

The modern European ideal is, that suburbs should take the form of a series of villages rather than stretches of building. The natural grouping round suburban railway stations supports such a method, with the result that the outskirts of the city cease to convey the impression that they are parts of a whole, and might, for all one can see at any one point, be 5, 10, or 100 miles away from the centre.

On many grounds it may be contended that this is not undesirable. To many the big town is unpleasantly oppressive, and were it not for the exigencies of a livelihood they would not dream of joining themselves to such a vast community, and would prefer to belong to a smaller one, such as the garden suburb simulates. The very large community only advantages a few of its members whose faculties are highly cultivated in some special direction. As far as a great many people in the cities are concerned, they would be far better, far more comfortable, and far healthier living in rural surroundings; but the actions and reactions in great cities are necessary to produce that keenness of mentality which means to a few the actual life, the actual vigour and force of the nations. This is not, as a rule, excited by the calm and quiet surroundings of rural life. For this the great cities exist,—from the economic standpoint. People, as a whole, would be better without the great cities, were it not for the fact that you must have an advance of activity—mental activity; and these things are provoked to an exceptional degree by the collection of people in large cities. In this respect they

are an essential part of the national economy, but their existence levies a heavy tax on the rank and file among their citizens.

Again it may be argued that many of our larger towns have ceased to possess a definite and individual character for so long a time that they are now a hopeless agglomeration of conflicting elements which cannot possibly be brought together into an harmonious whole.

Let us take this city of Madras for example :—

The old European centre of Madras was Fort St. George. It was practically the entire European city. Before people took to living in villas and gardens outside, up to a radius of five or six miles from Fort St. George, there was only the commercial city by the Fort. The various residential quarters round about came later; these areas are practically almost distinct in their purpose and in their use. Just try to imagine for a moment the various sections into which this city of Madras is divided. The city of Madras affords an exceptionally valuable study in that it can be said, if this is our town, what, it may be asked, is the use of considering it as a whole ? It is not a whole, but merely a series of discordant parts, affording an excuse for the view that we ignore it as far as possible and go our own way in the future.

In order to challenge this view we must look at the other side. The largest cities of a couple of centuries ago could be felt and realised in their entirety, while many, from some favourable point, could even be viewed as a whole, and to this day there are some, of which the general character can be grasped from a neighbouring eminence. These it may be admitted, are the exceptions, and the usual manner in which we comprehend the character of a large town is by a succession of impressions as we pass from one point to another. These impressions, being successive, it follows that under ideal conditions they should lead up to and reinforce each other like passages in a musical composition.

First, let us consider how and when we are likely to receive these impressions. Normally, this would be during our approach to or departure from some point near the centre; in the first case there would be a gradual transition from natural beauty to formal dignity, in the other the order would be reversed.

In speaking of a gradual transition we must not mean it to be inferred that we may not from point to point vary the effects towards formal art or freer nature. We may reach a subsidiary centre with formal lay-out and afterwards return to a looser and more open type of plan; but as we pass inward each culminating point should transcend the preceding one in respect of importance and dignity, while in the outward course the domination of natural beauty should become more marked at each intermediate point. In the railway approaches to a city such effects as these are only attainable to a modified extent, and more or less accidentally, as we have never realised the railways as an integral part of our civic scheme, and have allowed them to develop on absolutely independent lines, to the detriment of all other interests. Our main roads were almost forgotten as means of transit, but now they are once more coming into their own again, through the acceleration of vehicular traffic, their importance is correspondingly increased.

With the railways but little can be done, but there is much that we ought to take in hand in amending and beautifying our road approaches. Before the advent of the railways a fine tradition had been established in respect to main roads, as witness the roads of Madras. These are very fine roads: they were mostly made in the early part of the last century. But how many of these roads have been added since the advent of the railway? Probably but one or two, and even these are inferior in scale to the older ones. It is for us to take up this tradition where it was dropped and develop it on the basis of our own requirements.

AVENUE, MADRAS 32

AVENUE AND TANK, DEVAKOTA 33

In so doing a number of difficulties face us, the most serious being the linking up of new developments with the older ones of the ante-railway period.

There is another aspect of the problem. An important route demands a certain firmness of definition and formality. If we seek for the traditional method, we find lines of building continuing in well-proportioned masses on either side of the wide road. We have abandoned the use of blocks on this scale and demand that dwellings shall be spread over a much larger area of land; our buildings are therefore relatively ineffective and are not to be relied on as an enhancement of the dignity of the thoroughfare.

What can be substituted? We must have trees; a fine avenue (double rows on each side, if possible), is almost as impressive and dignified as the massive terraces of former years, and the further we go from the city centre the more appropriate these avenues become. There are plenty of examples in Madras of thoroughfares more or less without buildings, there are many roads that do not depend upon the buildings along their sides, so this suggestion is practically exemplified by some of the fine roads around Madras city. (See illustration 32.)

Avenues need not be quite continuous, as this would be somewhat monotonous in effect. Where justifiable a group of buildings of suitable mass and scale should strike the eye, and the proximity of water or hills should be taken advantage of to provide variety of outlook. (See illustration 33).

There is a certain limit in the length up to which the avenue becomes dignified and pleasant. If sometimes it goes to an interminable length you get a certain feeling that apart from the beauty of the trees it is a nightmare of monotony.

The most attractive portions of a railway journey are found where a viaduct crosses a valley or where the line skirts a hillside overlooking a plain. With our road we can rarely depart much from the general level of the ground, but still opportunities may occur to follow the line of a river or to skirt high ground possessing an open outlook on one side.

We have now some idea of the general framework of our city—the centre, the earlier developments, the later and generally less satisfactory ones, and the programme for the future. We have a rough notion of how these sections or zones may be linked up together, and of the modifications desirable in order to bring them into harmonious relationship with each other. You will have grasped that a study of the traditions is essential to a successful solution of such a problem.

There are, however, other types of tradition to be considered. So far we have disregarded all but those arising from the home and its surroundings. There are, if we may so call them, the traditions of business, of employment, of worship, education, and recreation, all demanding appropriate expression in buildings and their environment.

You in India know how firmly occupations are planted in fixed localities, and the inconveniences that arise when you try to shift and re-arrange these. As regards religious observances, the sites and buildings appertaining thereto, it is a recognised demand that they should be inviolate.

The established type of structure must be maintained, and this alone determines most definitely the aspect of the quarter of the city it dominates. (See illustrations 34 and 35.)

There are other features whose preservation it has not been customary to regard as of essential value, such as the old fort and city walls. These have too often been destroyed without sufficient reason, sometimes to the serious detriment of the city's appearance. These walls in themselves do not take up much ground, and even with a moat, which may be fairly treated as a park or open space, whether filled in or not, occupy nothing like the area of fortifications of the European type such as we see at

Fort St. George. They offer no great obstruction to the development of the city, and can easily be pierced to allow traffic or air to pass freely. (See 36 and 37.)

In 1913 the author was invited to give an opinion on the improvement schemes for Antwerp, and may quote the references in his report to the fortifications there, as illustrating his views in a case where these fortifications were neither as old nor as picturesque as most of the city walls in India.

"It is gratifying to see that the value of the existing fortifications has been so largely realised in the present plan for the city extension, and that it is intended to preserve their main outlines. It is, however, open to question whether the programme goes far enough in this direction.

"While recognising the impossibility of retaining the fortifications in their entirety it must be borne in mind that these, though comparatively recent in date, present one of the most perfect developments of the Vauban system (now obsolete), and that, as far as is compatible with the safety of the public, it would be highly desirable to preserve some of the typical features, such as the more important bastions, in their existing condition. These will be regarded in future years as interesting historical monuments.

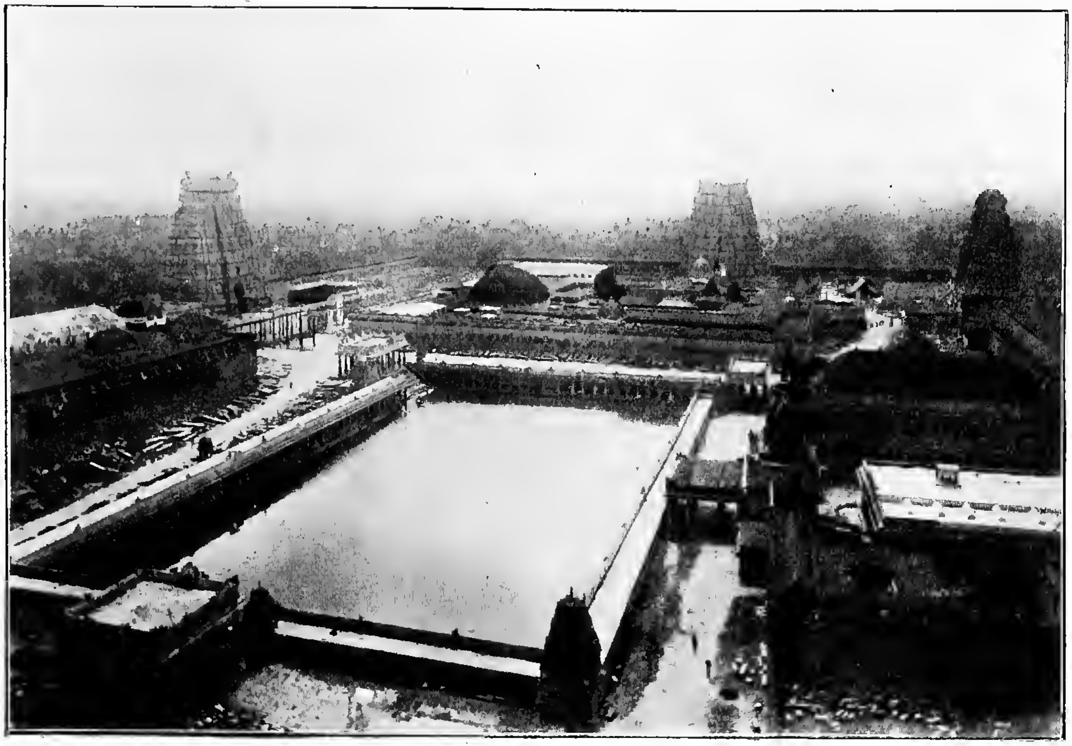
"This preservation would not preclude these ramparts and bastions being embodied in the proposed park system, and though some adjustments of level may be necessary, the higher portions, if retained or even accentuated, would be of great value in providing view-points over the surrounding country and breaking the inevitable monotony of a large city situated on a flat plan.

"While this has been to some extent aimed at in the existing scheme, its value might be enhanced by a more definite recognition of these view-points and a clearer attempt at the alignment of the streets in relation to them.

"I do not know if it has been contended that the preservation of any considerable length of the rampart would affect the due aeration and consequently the health of the adjacent areas of the city, but except in the face of statistics, I should doubt its exercising any such influence, and should feel that it would be preferable to leave the rampart as an elevated promenade above the level of the encircling boulevard."

You are now witnessing the beginning of a movement that must in many ways affect the general appearance of the Indian city. The more open lay-out, the increased proportion of detached buildings, the new requirements for administrative, educational and other purposes involve of necessity a variation in type of lay-out. Let it be your care therefore that no unnecessary divergencies tend still further to break up the harmony of effect, but by maintaining the general characteristics of form and design you secure as far as possible a continuity of manner so that the old shall blend insensibly into the new. Of course, one would like to point out that India has got its own exotic styles, and to deprecate very strongly extensive introduction into southern India of styles such as the Mogul or Indo-Saracenic, which tend to detract from the harmony of these southern cities. The old Dravidian style is a trabeated one and as such has a restrained and severe effect, though in exceptional circumstances it developed into extravagances. The Dravidian style as used in house building is rectangular and severe; and it is a great mistake under ordinary circumstances to introduce to a large extent features which belong to northern India. In fact some of the European styles, as the Greek trabeated architecture, are less out of harmony with the Dravidian buildings than what is usually termed the Indo-Saracenic style.

Our city is bound to be composed of a number of different kinds of buildings expressing their differences, but these buildings may be held together by the thread of tradition in architectural expression, much in the same way as the actual masses and groups of building discordant in the variety of their intention can be unified by lines and masses of trees linking them together and disguising or softening their discordancies.



CHIDUMBARAM 34

TIRUVANAMALAI 35

THE WALLS OF THE FORT, DELHI 36

THE CITY WALL, BARODA 37

Chapter VI.

CITY LIFE AND HOUSING.

The subject of housing is fundamental in Town-Planning—one can conceive a town without almost anything—except houses. We might paraphrase the poet's saying, " Let me make the people's ballads and I care not who makes their laws," with respect to houses. If the houses be good and suitable we have taken the most important step.

We know that the individualist home is not all that is wanted to make a fine city, and we know that sometimes the interests are so concentrated in private requirements as to exclude the communal ones. At the same time the standard of life in the home is bound in the long run to react on the city as a whole.

Just for a moment we will leave the city as a whole to take care of itself and consider what can be done to give an uplift to the general standard of housing.

In the provision of houses, the first consideration must be the character of those to be accommodated and their legitimate demands, both in the way of individual and communal accommodation. We must, however, go further than this, not merely meeting a present demand, but studying to realise and provide what ought to be demanded, raising, by means of a wise prevision, the standard of practical efficiency, health, and artistic taste.

To succeed in this, and to develop the capacity of the citizen, may be regarded as the main object of civic improvement, for naturally the city is for the citizen, not the citizen for the city, and it therefore follows that once a city has justified its economic existence, the study to be next pursued is that aimed at fostering the best type of citizen.

This study begins with the home and its adjuncts. Now the necessity for providing as much garden ground as is economically practicable is securing general recognition. A well ærated garden has a most potent influence on the health and mental activity of the young. A strip of ground shut in by rows of houses is woefully inadequate, and while the cost of roads, though it be smaller than in many European countries, and thus does not operate so emphatically, often precludes the general adoption of detached residences, a satisfactory compromise may be effected by grouping houses in blocks of three or four, so that the air may circulate freely.

Pursuing our study of social requirements, we may pass from the home and its " home playground " to the school and children's recreation ground. These factors in the education of the future citizen are important ones for those entrusted with the preparation of a city plan, and are influenced by the views of the experts in education as to how far children may be permitted to play in small spaces provided in immediate proximity to their homes, and how far their exercises should be conjoined with school life and under the supervision of trained teachers. The educational methods of the Dotteressa Montessori, in so far as they modify those of Frœbel and the other great educational leaders of the past, are likely to create a demand for school premises of a very different type to the existing ones.

Passing from the child to the adult, every encouragement should be offered for mental and physical recreative exercises. One of the principal defects of the modern large city is the dependence of its residents for amusement on the spectacles and entertainments provided by others rather than on exercises developing their own faculties. Every city should aim at providing, in convenient positions, recreative centres where the organisation of games and entertainments by the people themselves

may be judiciously encouraged, so that, by this means, mental activity and resourcefulness take the place of the sluggish apathy so often noticeable as the result of the inevitable monotony of many industrial occupations. It is necessary to touch on these social questions by reason of the fundamental position they occupy in city development schemes. The form of influence they exercise must of course vary greatly in different countries, but their neglect will result in a failure to reach the high standard of civic life that would be otherwise achieved.

Now it is not intended to suggest anything revolutionary. Had one even a greater faith in revolutions one would see that India is about the last place where they could be regarded as beneficial. The strength of India lies in its traditions—we may look at these and see what guidance they offer.

India has its types of house and has worked these out in such a fashion that they fulfil admirably the needs of those for whom they are built. Here and there little improvements and adaptations may be desirable, but the Indian house at its best seems altogether admirable. The drawback is that it is so seldom at its best and that, to some extent, the ideal of what the house should be has been lost.

There must be some reason for this state of things. One at any rate strikes us at once, namely, the tendency to overcrowding—and this in India is not based on economic grounds as in Europe, but on social ones. A given area is occupied by those of one religion, caste or trade. Owing to the contiguity of other castes or trades incompatible with the first, this area is unable to expand and increased provision can only be made by packing houses closer on the ground.

Again the division of property among members of a family tends in the same direction. An equivalent to the share of a house cannot always be given, even if some members of the family are prepared to go elsewhere. Often they are not, and what was once a good and suitable house is divided and redivided, so that it ceases to be a convenient or healthy dwelling place. The pial is enclosed, the court is built over, extensions are made at the back and many rooms no longer get proper light and air. Furthermore, housing of this type reacts on the national temperament. Becoming accustomed to overcrowding, people no longer feel that repugnance to such a mode of life and offer less resistance to the overcrowding that is inevitable when economic pressure in that direction is not combated.

Physique deteriorates, and rather than undertake a little extra exertion workers will pack themselves into inadequate accommodation because near their work, or sometimes even because near a busy and cheerful locality. Many Indians have become inveterate town-dwellers and to a large extent they will demand to be near busy bazaars and will submit to a great deal of overcrowding rather than remove to more suitable quarters.

You will agree that this is not an exaggerated picture of the state of things as existing in many an Indian city, and if this be the case what remedy can be prescribed. Restrictions as to the number permitted to occupy premises of a certain capacity are easily drawn up but difficult to enforce. The same may be said of by-laws restricting the amount of building on a given area, though with these perhaps the enforcement is a trifle less difficult.

One is inclined to put more faith in the policy of providing a counter attraction in the way of pleasantly arranged building areas, with every possible convenience, as near as possible to the congested districts, added to this increased open space, and improved facilities in some form or other. Even then the problem is a difficult one, but there are signs of an increasing appreciation of the advantages of this type of solution, and the more frequently it succeeds the less will be the resistance that is met with in the future; it requires skilfully organised adjustments so that the various castes

or trades shall not be violently uprooted, but rather offered some special inducement to remove.

It is one of the studies for municipal officials to know the special conditions that the different trades require, whether it be in the matter of space, special house sites, or things of that sort. It ought not to be too difficult to provide these in such a manner that certain caste trades would be willing to remove from a quarter where they are overcrowded to another quarter which could be shown to be equally suitable.

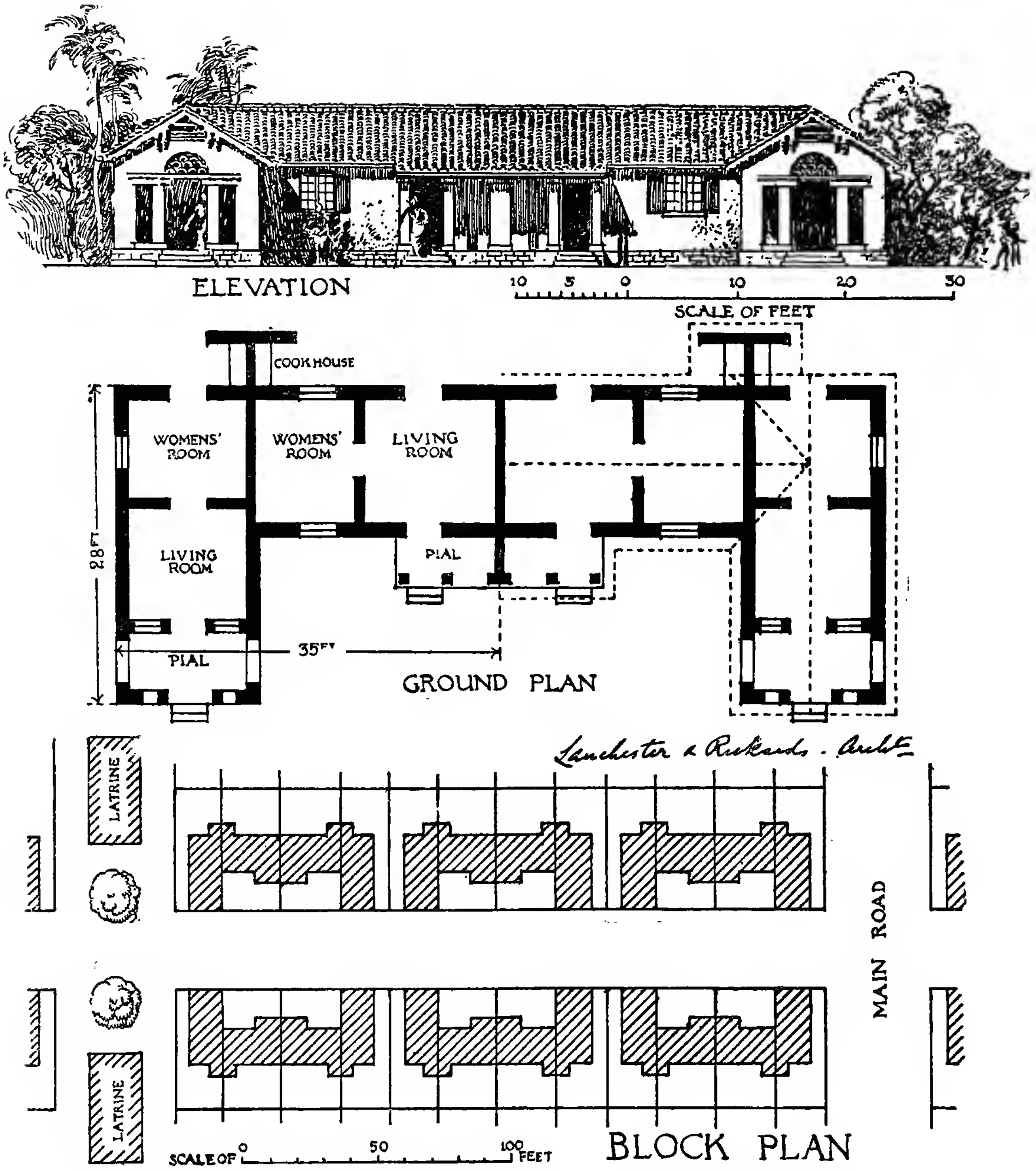
In laying out new extensions, possible future difficulties of this sort can be more easily guarded against. There is no reason to fill up the area solidly at once. Alternate sections or sites, preferably groups of sites rather than separate ones, may be kept in hand and temporarily let as gardens or for some other suitable purpose to the occupants of the plots dealt with, or even to others. Thus when a reasonable claim is made out for a house site in proximity to those first occupied, one of these can be allotted. By this means the desires of increasing families can be acceded to without creating congestion.

As a matter of fact, this is an extremely profitable way of extending the municipal estate, because without being too grasping we find that sites in a partially occupied area would, in a few years, become extremely popular and much sought after. Of course, one must guard against distributing them too quickly and freely, for if this is done difficulties will soon arise with regard to those who want to increase their holdings on account of family and other reasons in that particular area. On the other hand, it is necessary to use a little discretion as to the extent of these vacant sites, because there will be objections raised as to the vacant sites being scattered too freely in relation to those occupied.

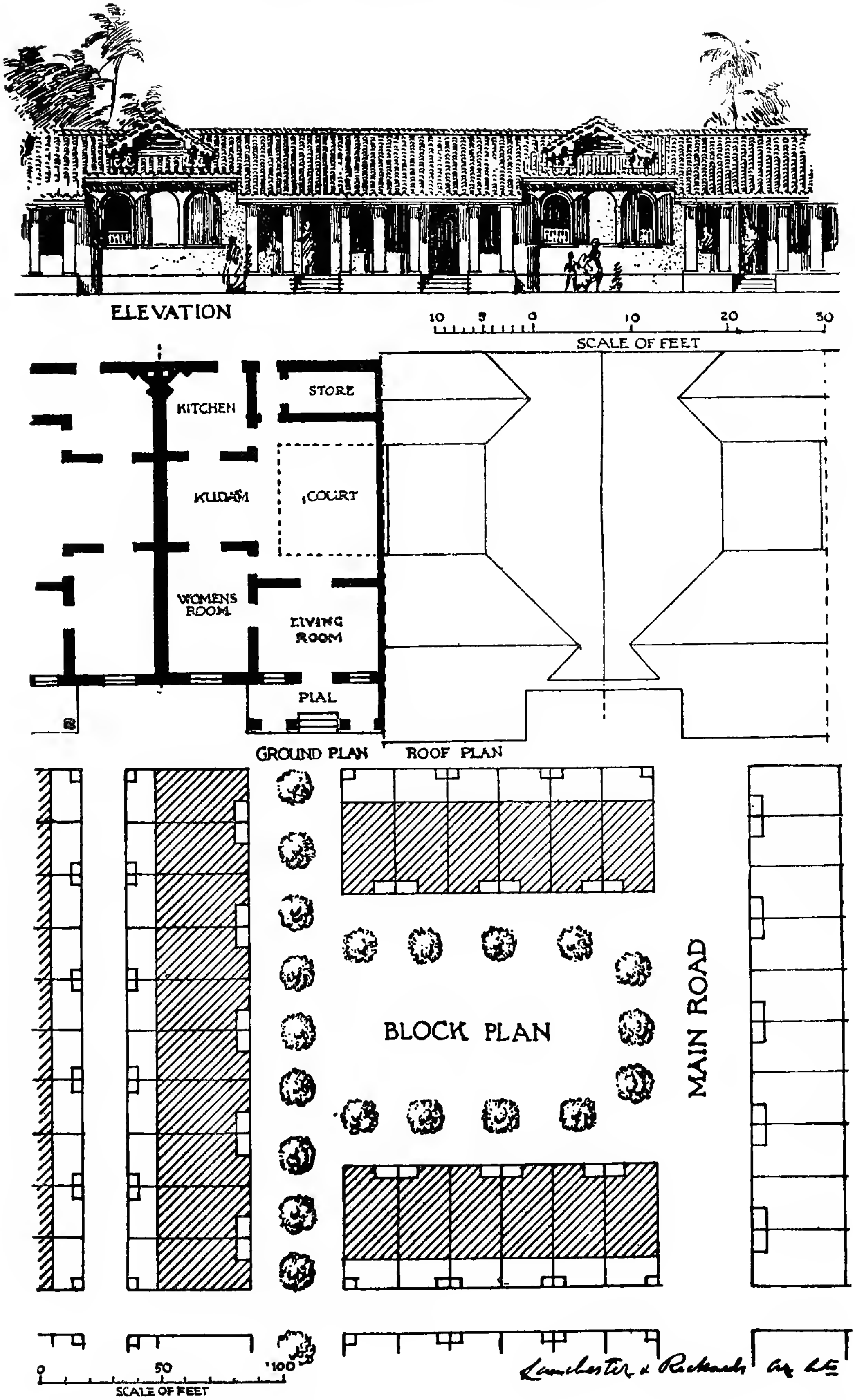
In planning extensions, while there may be no practical objection to treating these as separate and detached communities, there is a considerable risk that they will fail to attract for this reason. While we feel that this would often be the most rational type of growth, the habit of living in a busy town has become so ingrained in the nature of the townsfolk that they will be strongly averse to a situation definitely detached from it, even where no practical inconvenience would result. A site, to be popular, should be brought into as close relationship as possible to the busy life of the city and particularly with that of the quarter from which it is hoped to draw off the surplus population. A little ingenuity and expense is not thrown away in achieving this aim.

Let us pass on to types of houses to be encouraged. I have said that the Indian house appears a very good one. I do not say that it would not be desirable to increase the land which is generally allotted to it; and it is to be hoped that one day Indians will become more enthusiastic gardeners. There are some amateur gardeners, but one would like to see many more of them, because the garden is a most valuable adjunct to the home, both as regards the temperament and the education of the occupants and as beneficial to the health of the home itself. One thing to be noticed in nearly all the cities of Southern India is that the great bulk of residences are of one storey. You are very fortunate in not having gone in for building high houses such as may be found in the north, because these high houses, when you come up against economic development, result in the tenements and chawls which are so disastrous to the health of Bombay and Calcutta. It is to be hoped that we may never see these tenements and chawls in the cities of Madras. At home we have built great blocks of buildings and dwellings. But bad as they may be, they have been usually built under certain restrictions as to open space.

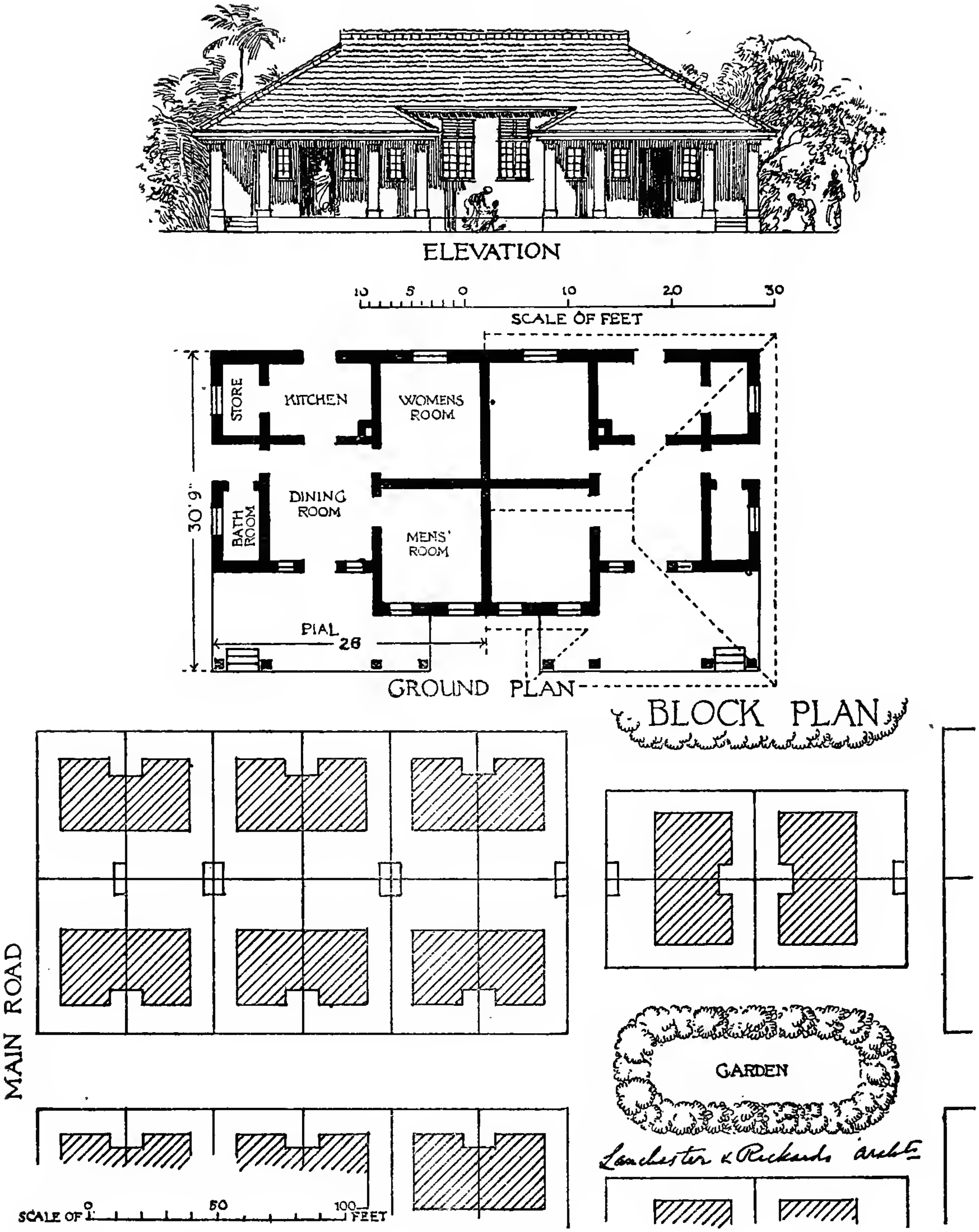
These great blocks have courts between them at least as wide as ordinary streets; whereas out here they have been allowed to grow up without such regulations, and in consequence there are lamentable buildings—buildings of four storeys with only narrow



SMALL HOUSES 38



COURTYARD HOUSES 39

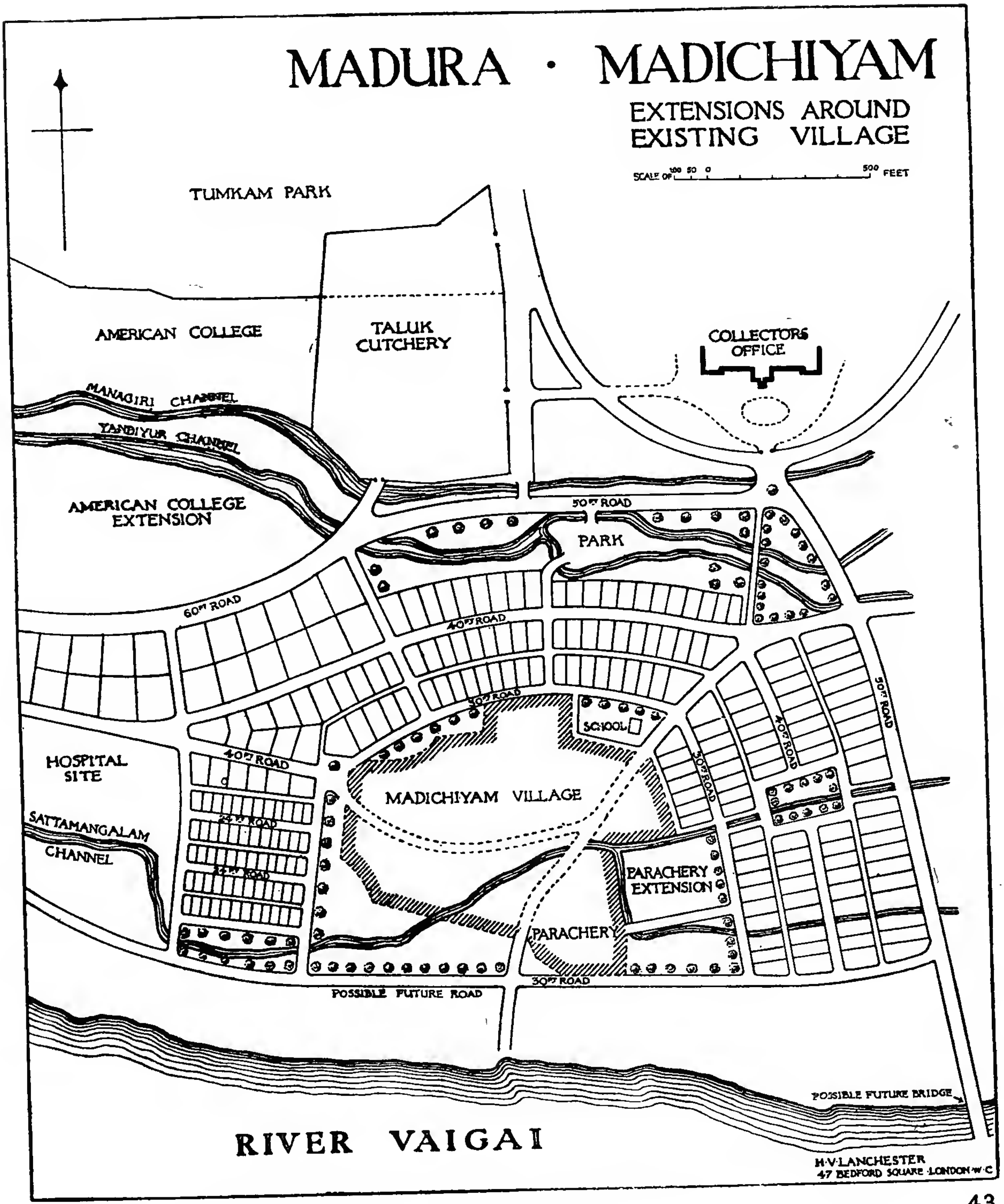


SEMI-DETACHED HOUSES 40

open spaces between them—only to be equalled in their bad influence on health by the tenements and dwellings of New York. New York is waking up now and is trying her best to get rid of the tenements that have been built on these lines, but it will be a long time before this unfortunate type of dwelling is abolished in Bombay and Calcutta. Having these in view we may hope that the warning has come in time to save the cities of Madras, and that in them such lofty houses will never be allowed to be built for the occupation of the working classes. The drawback is not only in the height of the building, which in itself is a disadvantage, but in the fact that it discourages the occupants from taking fresh air. Those at the top of the third or fourth storey are less likely to go out; so that it is difficult for the people, especially young children, to get enough of the open air. With the poorer classes, it is altogether disastrous that they should be housed in these high buildings, even if the location is not necessarily unhealthy. What has been said about each house having a certain amount of open space of its own is, you will see, quite impracticable with a building of the type of one of these four-storeyed blocks. (Designs 38, 39, and 40 show suitable one-storey houses.)

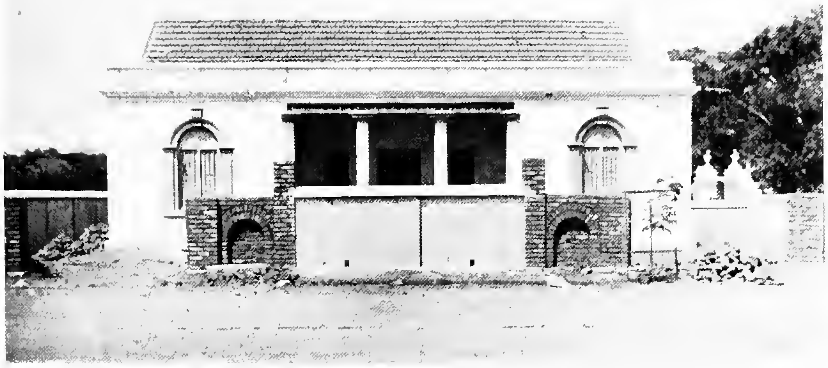
Then we come to the question of house and garden. Now, the movement at present is all in favour of detached houses. It is easy to see that the perflation of air is much more satisfactory if the houses are detached; and if the people can be persuaded to garden the ground around them, they will be very much healthier and very much better off in other ways, too. The influence of plants alone in taking up the impurities that percolate into the soil is one of the most valuable features of a garden. In India there is less need to group houses than in Europe, so as to economise the area to be utilised in roads and consequently the area to be maintained. Here, of course, with the usually dry climate and comparatively low cost, the difficulty of the maintenance of roads is not such an important factor. At the same time, the possibility of diminishing the frontage demands consideration if at the same time it can be ensured that the houses will have an adequate open space around them. (See illustrations 41, 42, and 43.)

Then one may point out that nowadays we must be quite prepared for great extensions of the city area beyond what has been customary in the past. We are prepared to grant house sites about four times as large as those which the same class of persons have been in the habit of occupying. That means at the least four times the area occupied by the present city. We have got to recognise that there must be some organisation, some method in the arrangements, in order that the city may not cover an unwieldy area. The old city was packed and congested. People do not care to go very far from the central points where they have been accustomed to pursue their avocations. Well, now, how are we to avoid the undue amount of time and energy lost in running about over a very much increased area in the large city which takes the place of the small congested one? One point is that in the location of special trades and industries in definite quarters, and the arrangement of the housing in connection with these allocations, it should be seen that the people who live in a certain quarter will find their occupation as near as possible to that side of the town. The old sastras point the way, showing how to allocate the various people in the various parts of the city. Take the four great divisions. The sastras say that they shall be located in the four parts of the city. One cannot say that this is exactly practicable without expanding the method, but you have only got to pursue the same system, which gives a clear indication of what is wanted. By studying a city and seeing where the various occupations are located and how they are subdivided, not thinking too much the letter of the law, but trying to fulfil its spirit, it will be seen that it clearly points to the fact that the people should be located in such a way that they will be most conveniently placed in relation to the occupations they have to pursue. And in that way one is able to



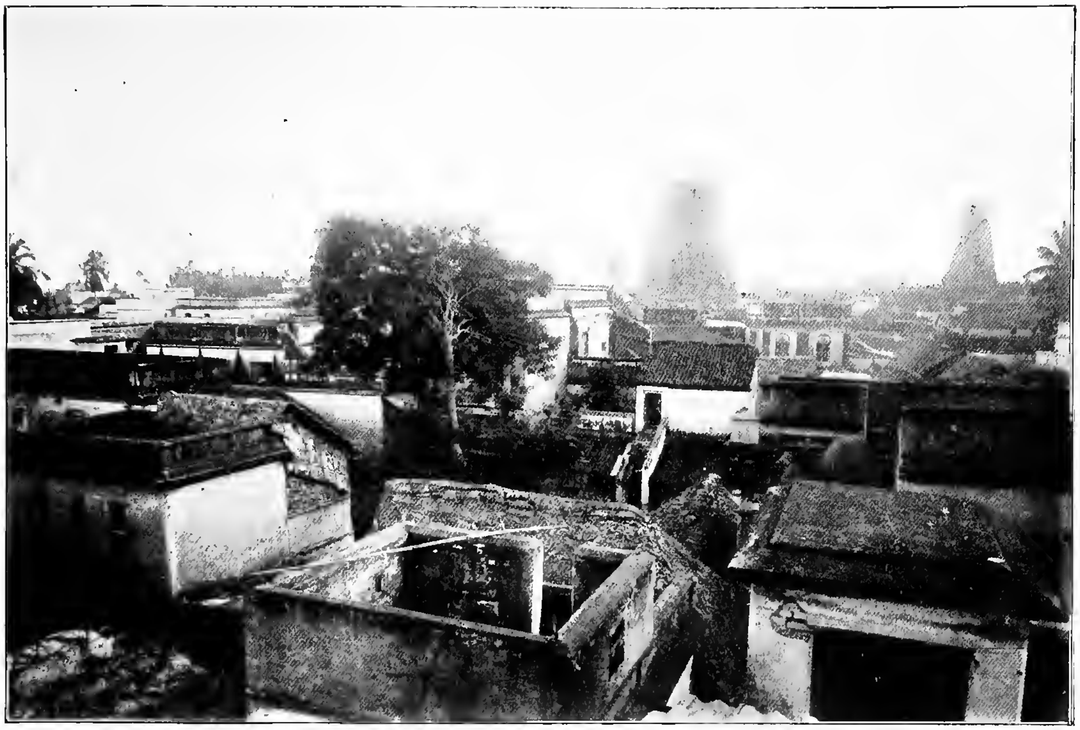
PLAN FOR LAY-OUT WITH VARIED SITES

43

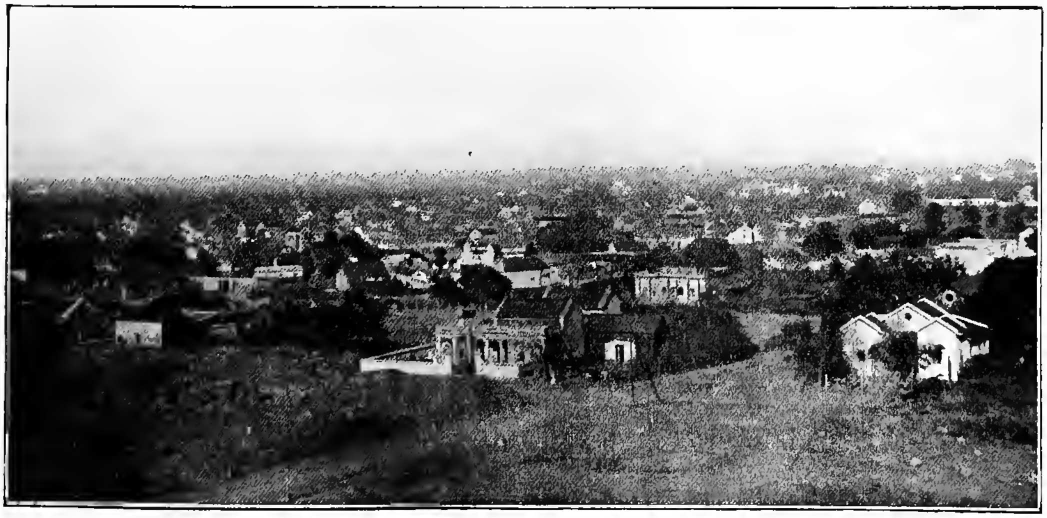


A DETACHED HOUSE 41

CHETTY HOUSES, KANADUKATHAN 42



CONGESTED AREA, MADURA 44



BANGALORE. THE SUBURB OF BASAVANGUDI 45

counter-balance what appears a somewhat unwieldy growth of the city, when this method of giving increased space in order to avoid congestion has been adopted.

As a broad generalisation one may assume that to a large extent castes and industries are identical. We have a number of more or less industrial classes, and thus the matter is simplified. A sub-division of cities by caste areas is also to a large extent a sub-division of the city by industrial areas. Some of these find their own places naturally. Some of them, the agricultural people, are placed by choice round the edge of the city. The Indian city is often rather too much like an enlarged village, industrial and agricultural occupations are apt to get too much tangled up in the heart of the city. It would be much better if such occupations as cattle keeping and the like were on the edge of the city rather than in closely built-up areas. In the European city, few cattle are to be seen in the busy quarters. It is far preferable that provision for them should be decently arranged in the suburbs of the city. There does not seem to be sufficient reason for making, as it were, a village with cattle in the heart of the town. Still one recognises that all these things must be adjusted and arranged for by degrees. If the possibility of moving industries of this kind to the outer fringe of the city, and organising these so as to keep them out of the tightly packed central quarters, is borne in mind, it will be an undoubted gain both from the sanitary and economic points of view.

Then, again, this expanded city brings forward the demand for subordinate centres, subordinate educational centres, subordinate bazaars. The city has outgrown the single bazaar or the single centre. Most places contain numerous temples (very often temples belonging to certain specified districts and those of the various occupations). In the same way we ought to try and develop subordinate centres for other purposes, so that remoteness from what was the original city centre will be counteracted by encouraging the business and the popularity of these subsidiary centres.

It is also worth while to consider whether it will be possible to encourage each district of the city towards a sort of communal activity in regard to recreation. There are different occupations and castes ; we shall find that they have their own preferences as to one form of recreation or another, and it can be arranged that people of the same general status playing the same games shall have the added rivalry between one suburb and another, and competition will give zest to their efforts. All these factors will help to diminish the possible unpopularity of suburban extensions. Still one cannot help feeling that there may be certain prejudices against the extension of the city to the extent that, it is extremely probable, will be required. Only skilful handling will remove all grounds for such prejudices. It is undesirable that the city should become disorganised, the fault with many European towns where the people in one part of the city take no interest and have no idea as to what is going on in it as a whole. But obviously, rather than packing the town with buildings so close together as to become unhealthy, it is better that the aim should be to combine the advantages of small communities with the advantages of the large group.

Chapter VII.

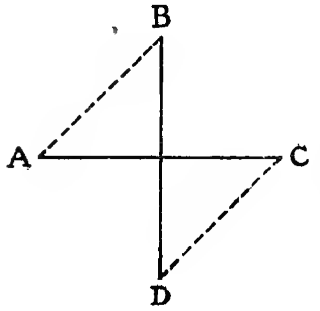
COMMERCE AND TRAFFIC

In considering a special aspect of city life it is necessary to guard against the liability to assume that final results can be arrived at by this analytical method. Civic studies are essentially synthetic, and can only be sub-divided as a prelude to an ultimate re-combination.

The mistake has been too often committed of making a special study, such as this, the basis of a series of proposals, without regard to the conditions as a whole.

Taking the case of commercial methods and any economic system based on these, it may be affirmed that if they are regarded from the standard of material economic efficiency solely without regard to the resulting effects, both physical and psychological, on the community in general, we must not base our final conclusions on those arrived at by such an investigation.

Again with street traffic and improvement too often a partial investigation has been regarded as conclusive. The obvious and easy course of finding out where streets are overworked, and providing relief by widening or some other method, has been responsible for much ill-considered destruction. Even when we investigate traffic alone we should go further than this and, even the most comprehensive study of commerce and traffic has moreover to be related to the other aspects of city life.



An example of extreme simplicity will give you an idea of analysis demanded. Imagine two streets crossing each other, A C and B D, which are overcrowded. Suppose you want to make streets to relieve the congestion, if you do not analyse the traffic, you may find yourself doing the wrong thing. Suppose that there is a great deal of traffic in two directions, A to B and C to D, then obviously new streets from A to B and from C to D will divert this traffic, but if the traffic is all from A to C and B to D, these streets would be useless, would not take away even a single vehicle. It is not enough to find that a street is overcrowded, but it is essential to find out the complete course and destination of the traffic.

It has been held that—at all events in modern times—commerce and manufacture are the bases of town growth. For all questions relating to the manufacture and handling of the production and export of the city, and similarly with regard to the produce and goods she takes in exchange, the Chamber of Commerce and trading associations are obviously the proper bodies to be consulted. In the United States the Chambers of Commerce have come to take a leading part in the movement for civic advancement. This has been found highly beneficial in two ways. Firstly, the closer relation between those skilled in business and the municipality has been conducive to city developments being carried out on lines leading to commercial prosperity; and, secondly, those perhaps originally too closely concentrated on purely economic activities have come to see these must be looked at in conjunction with the convenience and amenity of any city that is to remain permanently great. To make this point clearer: with any large community the utmost care must be exercised to maintain the human type at its best—the tendencies to deterioration are numerous and subtle—so that if we proceed solely on the basis of immediate economic success, these tendencies will begin to operate, and ultimately the advantages we have gained may be neutralised owing to deterioration in the type of citizen.

On the other hand, if we concern ourselves solely with the beauty and amenity of the city, regardless of its economic demands, we may find that, while possessing many attractions and delights, it is no longer able to earn its own living.

Thus you will see the necessity for a synthetic study of all the aspects of civic life, while at the same time this study will be more clearly and definitely accomplished if it is preceded by those special studies that have divided under various headings described in detail in the chapter on the Civic Survey. These studies mainly consist of the collection and presentment of statistical information in such manner as is of most value for purposes of comparison, and here I would point out the peculiar advantages of graphic methods as affording information in a form quickly and easily assimilated.

What have been entitled "strategical advantages," that is strategically in regard to commerce, of situation and natural supplies, determine the town's development, subject to the qualification that these must not operate in a way detrimental to the well-being of the citizen in the long run. Thus a place may have great advantages and yet they may be nullified by an unhealthy situation, or even, while it be not definitely unhealthy, if the climate or conditions tend towards a deterioration of physique and energy.

Having now laid down as briefly as possible the limiting factors of this section of commerce and traffic we may pass on to a more detailed consideration of this special branch of our civic studies.

This is one of the cases in which the comparison with the methods of others, and especially the newer, cities is of value; economies in manufacture and transport having been highly developed during recent years. Of course, conditions vary very greatly, and only the most thorough examination is of value in determining the methods most appropriate to any particular place. At the same time this examination is necessary; to leave the question to be settled by experiment is to court financial disaster.

We may notice just a couple of examples, illustrative of what is meant. In the latter middle ages, in the sixteenth and seventeenth centuries, the city of Venice found her commerce declining. She did not—of course it was not understood then—the science of economics hardly existed in those times—she did not try to know the economic reasons, and was content to coddle up her commerce by various restrictive and fiscal regulations, by restrictions as to shipping whereby she thought she would save herself from decay, and again by fiscal regulations against other countries. But it did not have the slightest effect. Her commerce, owing to certain circumstances, among others the discovery of the Cape route, steadily declined, and Venice at the present day is but a shadow of her former self. Possibly—I do not say necessarily—if she had studied the difficulty from the start, she might have found some means to save that deterioration of activity.

Another city, Coventry, owing to the abandonment of import duties on silk goods in England, lost almost her entire trade. She hunted about, not municipally, as we had not arrived at that state of things then, some 20 or more years ago—she took up other trades, cycle and motor trades; and to-day Coventry is twice as rich, twice as active, as she was before this blow fell upon her. Therefore, one may quote these two instances as showing the value in making a practical investigation; and in future it will fall upon municipalities to undertake such duties with the aid of the leading commercial men of the city—to make a practical investigation as to what business can be made to pay and what advantages the city has in this respect or in that.

Let us just recapitulate the main headings under which these studies should be taken up. We may start with the import of goods. What is imported, for what purpose, how it comes, where and by what means it enters the city, how handled and sub-divided, its destination, whether as food or clothing for the individual, as raw material for the factory, or some other purpose. Our object being to see whether all such goods are

dealt with in the most economical way or whether by remodelling or some other form of improvement we may not be able to facilitate and cheapen these operations. Imports will fall mainly under three heads—town consumption, raw material for the factory, and goods collected for re-export. One may give an instance of deficiencies in this respect which will be found more fully indicated in Mr. E. P. Richard's report on Calcutta. Calcutta does a large amount of business in jute, as most of us know. This jute is brought into the city and remarketed again and again; and there are sometimes three or four unnecessary journeys—unnecessary owing to defective commercial methods,—through the streets of the city by bullock cart. This is obviously a great handicap to traffic, and Calcutta bullock carts, as you know well, take up a good deal of the width of the roads. If it be not necessary to take this jute in this way—and it is not necessary—Calcutta would be a very much richer city. What would strike a western mind is that these jute godowns, being scattered through the city, being next door to the house of the one who purchased or sold jute, should be located on some system, not necessarily at one spot, but should be arranged in a systematic manner and that it should not be necessary to pass jute from place to place simply because it passes from one man's hand to another. This is just one example as to how the commerce or the traffic of the town is handicapped by the defective methods of dealing with the goods. That is one of the great differences between the Eastern and the Western methods. The merchant here seems to have a great fancy to have his goods, if not in his own house, at any rate close under his own eyes, whereas among the Western nations a man will have his office and deal with an immense mass of goods which he personally never sees at all. He will know that they are in such and such a warehouse; it will be put on the record in his name and will only be moved under his authority. If it is sold to another man, the name is transferred, and this goes on until the goods are finally shipped to the place where they are intended to go—the raw material to the factory or food and clothing to be distributed among the people who want such things.

Passing on to the articles the city supplies to other places in like manner, we must deal with every class of goods made or handled for export, following the operations step by step on the look-out for more advantageous methods.

Of course we have separated these two things, import and export. Perhaps they cannot be kept entirely separate, but it is well for you to separate them mentally as far as possible. *i.e.*, the goods that come into the city and the goods that go out.

In conjunction with this investigation we must consider also the location of the workers, whether convenient or inconvenient for their employment; how loss of time and energy can be minimised by improved facilities for locomotion, for allocation of housing areas, and such like methods.

This done, we have the material on which to base a reliable conclusion as to any proposition for improvement; we can say whether the cost would be justified economically or not. Possibly it may not be practicable to give every consideration an exact monetary value, but at all events we shall come much nearer to exactitude in our conclusions than we should without the information indicated.

As an example of method we may take the traffic question by itself and will endeavour to give an idea of the type of analysis I would propose.

There is no occasion to emphasize the necessity for the study of traffic conditions, which is now generally realized. We must, however, refer to two factors that have not hitherto been adequately dealt with. One of them is the lack of regulations for sorting out the fast and slow traffic and directing these as far as possible into distinct lines of route. The traffic question has not reached an acute stage in most of the cities of India. Calcutta is, perhaps, the one exception. Bombay is beginning to feel little troubles here and there. Certainly Madras has not got them in an accentuated form.

But it is just as well that we should know something about traffic difficulties, because they are very likely to arise, if not in the cities as a whole, in any case at a few points. Referring to the regulation of slow and rapid traffic and directing them along two distinct routes, this might bring about great economy so far as streets are concerned. The quicker the vehicle the less time it takes on the road and the less obstructive it is to traffic. If a vehicle like a motor-car has to go behind a slow vehicle, it has to be checked and stopped at times, and it takes just as much of the street as the slow vehicle. If it had a clear run to get away at its own speed in its own street, that street will be comparatively unobstructed. Fast traffic will get away quickly, while at the same time you will have streets left for more uniformly slow traffic. There is much to be done in the future in allocating different roads to different kinds of traffic.

The other point is the investigation as to how far the traffic in a busy street is "internal"—that is to say, from one point in the street to another, and therefore incapable of diversion. Statistics on this basis are not easy to obtain, but a great deal may be done by securing a fair general impression of the manner in which such a street is used. Where it is mainly a shopping street there can be no doubt that much of the traffic is of this kind, consequently it would be well to regard such a street, as far as possible, independently from the general provision of traffic routes.

One feels very strongly that in India it is a great mistake in the case of a busy bazaar to widen the road and to disturb all the business of the town in order to increase the traffic facilities. In very few cases, if a bazaar is congested, will you be able to increase the traffic facilities without great disorganisation ; and as regards traffic itself it is far better to try and find a less valuable quarter through which you should make a street diversion and through which you can take the outside traffic, leaving the bazaar in its original and present condition. A bazaar is not a good traffic street. In Europe it is a pure accident that our main road has become a shopping street; that is due to the neglect of the main roads on the incoming of the railway, with the result that the main road was made a sort of elongated bazaar. You often have the principal street in the city as a bazaar, and it is not this street that should be employed for your through traffic—traffic that goes some distance out of the town. If possible it will be better to find other routes for this.

In other respects the needs of the traffic are beginning to be well understood. We can deal fairly confidently with the substitution of the motor for the horse, and with other methods of which examples are at present in operation. It is impossible to forecast what the future may bring forth, either in the way of utilisation of existing inventions or the development of inventions yet to be discovered. While every possibility capable of verification should be investigated, it is clearly out of the question to attempt to consider those which cannot be submitted to any test of practicability or value.

We have most of us got some idea of the possibilities of flying. It is likely that in the future it will make a very great difference to traffic conditions, but we cannot for the moment—it is not reasonable for the moment—to take this into consideration, because flying as a means of transport is apparently too far ahead. Who would wish to sit down and live in his town saying "things will come all right when we transport our goods through the air."

Having given a passing mention to these indeterminable factors, we can now proceed to consider how the definite economic influence on city improvements may be investigated. To do this clearly some illustration will be needed.

The dominating factor which has been recognised as the main objective of recent investigations is the organisation of traffic, though, of course, there are other considerations more or less linked up with this.

The first requirement is to obtain values by distance or by time for each class of vehicle affected, so that any saving in mileage can be classified on the lines accepted in the public traffic reports and a value assigned to each.

Having done this, the next procedure is to obtain statistical information on the traffic likely to be affected, and to estimate what proportion of it will be advantaged. One says distance or time, because these are alternative methods of valuation; a saving in distance is worth more than a mere saving of time, because the gain is that of the time occupied over and above the cost of the energy expended to cover the distance. This item of cost is, however, relatively so small that in most cases an estimate on a time basis which is easier to obtain would be sufficiently near for practical purposes.

In the gathering of these statistics many pitfalls must be avoided if the deductions are to be sound. Thus it is not only necessary to estimate volume of traffic, but to dissect its purpose in detail. Take the simple case of a bridge. We know that the traffic is pledged to pass from one end to the other, but that is all; if we wish to know to what extent another bridge at a specified distance away will afford relief, we must know the destination of every vehicle and every passenger (whether walking or riding).

Now, in analysing the traffic in regard to an improvement, it is of the first importance to separate the local from the through traffic on the basis of defining as local traffic that which cannot be diverted, and through traffic that which may, while the latter will again require sub-division accordingly as it is more or less advantaged by a new route.

This done, separate tables must be prepared for each class of through traffic, so that these may be valued, somewhat on the lines of the schedule given below.

SUGGESTED TYPE OF TRAFFIC SCHEDULE.

No. per day.	Class.	Unit value per hour. s.	d.	Average time saved in minutes.	Saving per unit in pence.	Total saving per day. £	s.	d.
240	Large vans	5	0	5	5	5	0	0
200	Small vans	3	0	5	3	2	10	0
120	Carts	2	6	6	3	1	10	0
40	Hand trucks	1	0	6	1½	0	5	0
100	Motor-cars	10	0	3	6	2	10	0
100	Do. passengers	15	0	3	9	3	15	0
300	Taxicabs	3	4	3	2	2	10	0
300	Do. passengers	10	0	3	6	7	10	0
240	Motor buses	6	3	4	5	5	0	0
240	Do. passengers (25)	12	6	4	10	10	0	0
400	Cyclists	1	0	5	1	1	13	4
2000	Foot passengers	0	6	10	1	8	6	8
						50	10	0
	313 working days and Sundays counted as 17 =						330	
	Annual saving ..					£16,665	0	0

This sum capitalised at 5 % is approximately £333,000, the proportion of cost that can fairly be charged against traffic economies.

Such a schedule as this must be regarded as typical merely. It is based on an English traffic value and would need to be transposed into Indian terms. It should be noted that it deals with the value of the vehicle, be it motor-car or bandy; and also with the value of time saved for the people in the vehicle. The value of time saved for both the vehicle and the passengers must be taken; thus one gets

the total value of time saved per day for all the vehicles and also the foot passengers that cross the bridge. In this assumed case of a bridge in Europe the total saving per day is £50, and the annual saving is £16,000. On this basis it would work out that to spend £333,000 on building a new bridge would be a remunerative investment to the public at large.

This schedule is perhaps on too large a scale to be practical here. Probably the figures should be divided by twenty to represent conditions in India.

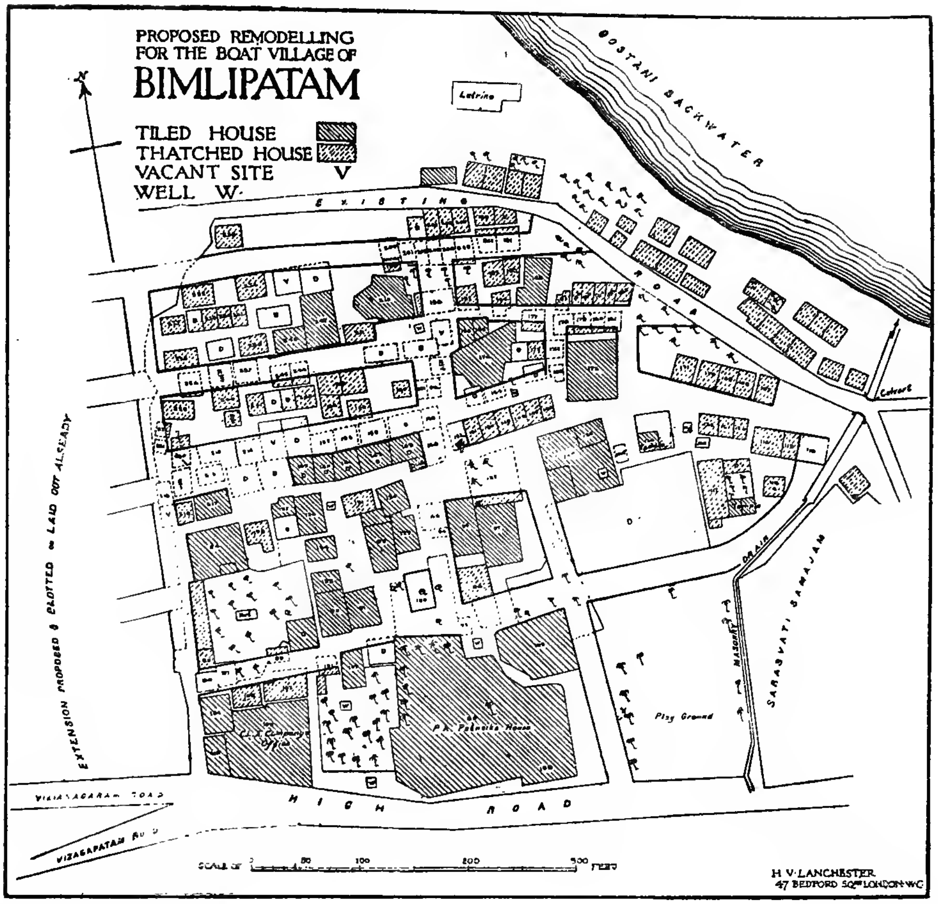
Traffic economies, though the most important, are by no means the only consideration; for instance, safety to life and limb must be regarded in the development of any scheme. There has always been a certain delicacy in placing an economic value on human life, and an inclination to treat it as incapable of measurement in monetary value. In reality our practice is to protect life to the utmost that economic conditions will allow; but none the less there is a certain limit to the expenditure possible in the interests of safety, so that an improvement enhancing the security of the public against accident is entitled to a credit in this respect much greater than an actual insurance risk, on account of the strong public sentiment in favour of a maximum safety.

There are also a number of small comforts and conveniences incidental to a well-devised improvement scheme, such as advantages to health, reduced mental tension, and general amenity, which, though not capable of reduction into definite values, all help to turn the scale in favour of action. This also may be mentioned, that a badly-devised improvement scheme may inflict injury; and we have to be careful to see that we have a well-devised improvement scheme.

Thus, in summing up the consideration for and against we have as a main factor the economy in traffic working which can be approximately estimated, supplemented by a number of collateral or subsidiary advantages which should be taken account of, even if their valuation cannot be very exactly determined, while, on the other hand, we must not fail to notice some temporary disturbance of business over and above that provided for by the usual forms of compensation. This is particularly noticeable on road-widening schemes. Road widening should be avoided wherever possible, because it disturbs the business associations in the street concerned.

There is one point especially worthy of mention, namely, the advantage of footpaths in European cities. It would be impossible to carry on the traffic in the larger cities if people walked in the roadway, as they are accustomed to do in India. One cannot help thinking that in the larger towns the introduction of definite footways would be a very great advantage to traffic. No one thinks of walking in the road in London, except while crossing, and then keeps a sharp look-out that lest he should be run over. In some places there are sub-ways provided, such as you find in railway stations, in order to avoid the rapid traffic that passes along the road. Thus there is an increasing provision in London for the safety of the foot passengers, especially where several important roads meet, while in India few places have reached the stage of providing footpaths.

Thus in a somewhat discursive way we have dealt with the main features of this section of our civic studies. As the basis for a more thorough investigation, reference may be made to sections C and N of the Civic Survey (Chapter III.).



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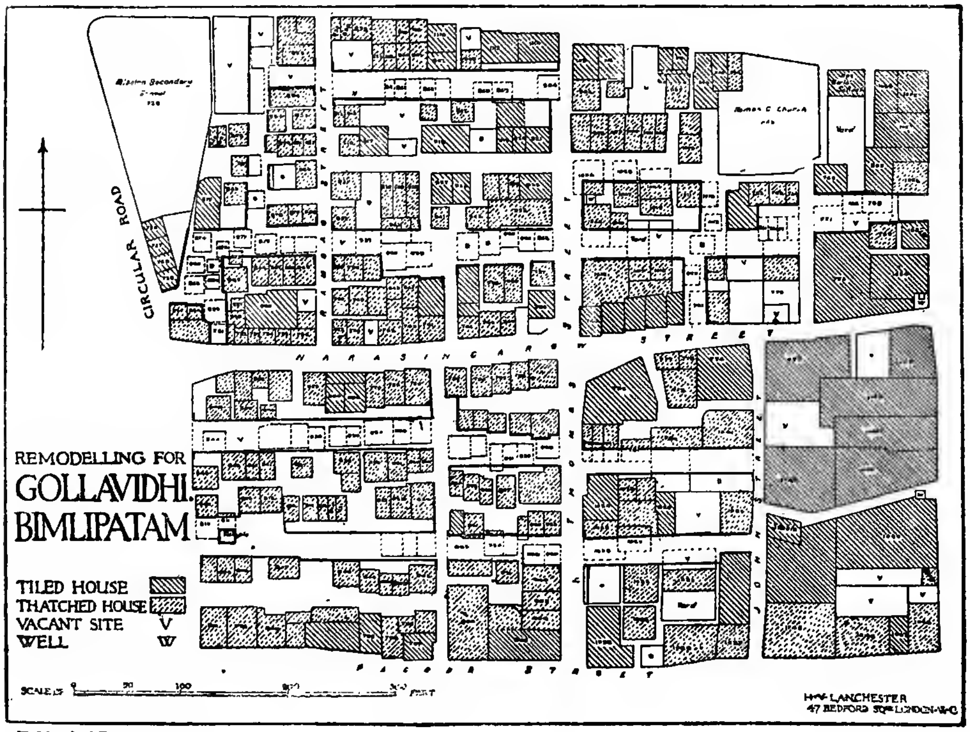

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Chapter VIII.

THE TECHNIQUE OF CITY IMPROVEMENT.

Improvement schemes as we understand them at home are distinguished from city extensions and deal almost entirely with areas at present occupied by buildings. They are generally undertaken for one of two reasons, either for the improvement of traffic facilities or for the elimination of bad types of housing—" slums," as we term these. Sometimes both these questions are dealt with in one scheme, as for instance where a new traffic street is aligned through a slum area. The same term " City Improvement " may be used in the same specialised sense in India equally well, as there are many schemes of this character in hand quite distinct from proposals for city extensions.

Many of these schemes do in fact involve extension proposals for a reason that we will go into later—confining ourselves for the moment to the problems of what we are regarding as " Improvements " as distinct from extensions.

In considering the needs of these, we must refer to our civic survey and take the guidance it gives us as to congestion, traffic needs, values, and such other matters as may affect our programme. Improvements involving, as they do, destruction of property and disturbance of interests, are not to be lightly undertaken because somebody or other has a feeling that this thing or that would be an improvement. They must be carefully studied beforehand and the advantages claimed in each case satisfactorily proved.

The reasons for the undertaking may be varied—such as health, convenience, amenity, etc., or we may find these in combination, but they should be definitely valued, and every consideration for or against duly weighed and balanced up before active steps are taken.

It is here that the preliminary survey work is of such value in enabling us quickly to form an idea both of the interests affected, the objects to be aimed at, and the cost of the undertaking, so that when a number of propositions are brought forward we can decide as to which is the most urgent and which will give us most results in proportion to the expenditure and the disturbance involved. A frequent case, where comparisons are especially necessary, is that in which it is proposed to reduce congestion by the formation of new streets and open spaces. These are far more often required for the purpose of opening out overcrowded neighbourhoods than as provision for the needs of traffic, so that, desirable though a direct thoroughfare may often be, we must be careful not to let the idea of this obsess us and lead us to adopt a scheme more extravagant than the actual needs of the case demand. It is always advisable to avoid the destruction of good class property, and it is usually solely in the interests of traffic that such destruction may be contemplated, therefore the traffic need must be proved before this can be justified. If it is improved æration and relief of overcrowding that is aimed at, we shall find that the " weeding out," as we may term it, of the worst type of dwelling will almost always answer the purpose. (See 46 and 47.)

We may regard it as extremely rare to find that wholesale demolition is a proper remedy, and it can only be advocated where this course will result in the substitution, for the same people who are dishoused, of a much higher class of dwelling. The measure has too often been adopted without any security for such a result.

In England it is a recognised duty that before removing a slum we shall see that

the occupants have other convenient and superior houses to move to; very few of the poorer people own houses, and the duty often devolves on the municipality of building new houses for these who will rent them from the municipality at rents that must be within their means. Sometimes a rent has been fixed beyond the means of the people who have been dishoused; and as a consequence a superior class of people have taken up the houses intended for those evicted and therefore these latter have only been able to secure accommodation a shade better than that destroyed. The general view is that the dishoused should be moved into suitable new houses specially provided for them.

Now in India the occupants of even the very smallest houses often own their dwellings, so that it is none the less a duty to ensure its being made easy for them to find new homes in suitable locations in place of those to be removed.

The tendency towards overcrowding is more difficult to combat in India than in Europe, and it is for this reason alone more urgent that the authorities should not only make it possible for those dispossessed to find other homes, but should organise the removals and provide every facility in their power. Sometimes the payment of a proper monetary compensation has been regarded as discharging this duty, with the result that those householders deeply in debt, and many are in this unfortunate position, have been compelled to use this money to discharge their debts and find themselves with no longer a home and no means to provide a new one. Overcrowding thus becomes inevitable.

It is clear that if there is any risk of this, municipalities must do more towards arranging for the rehousing of those turned out than has hitherto been customary, though in all fairness we must admit that the attempt has frequently been made.

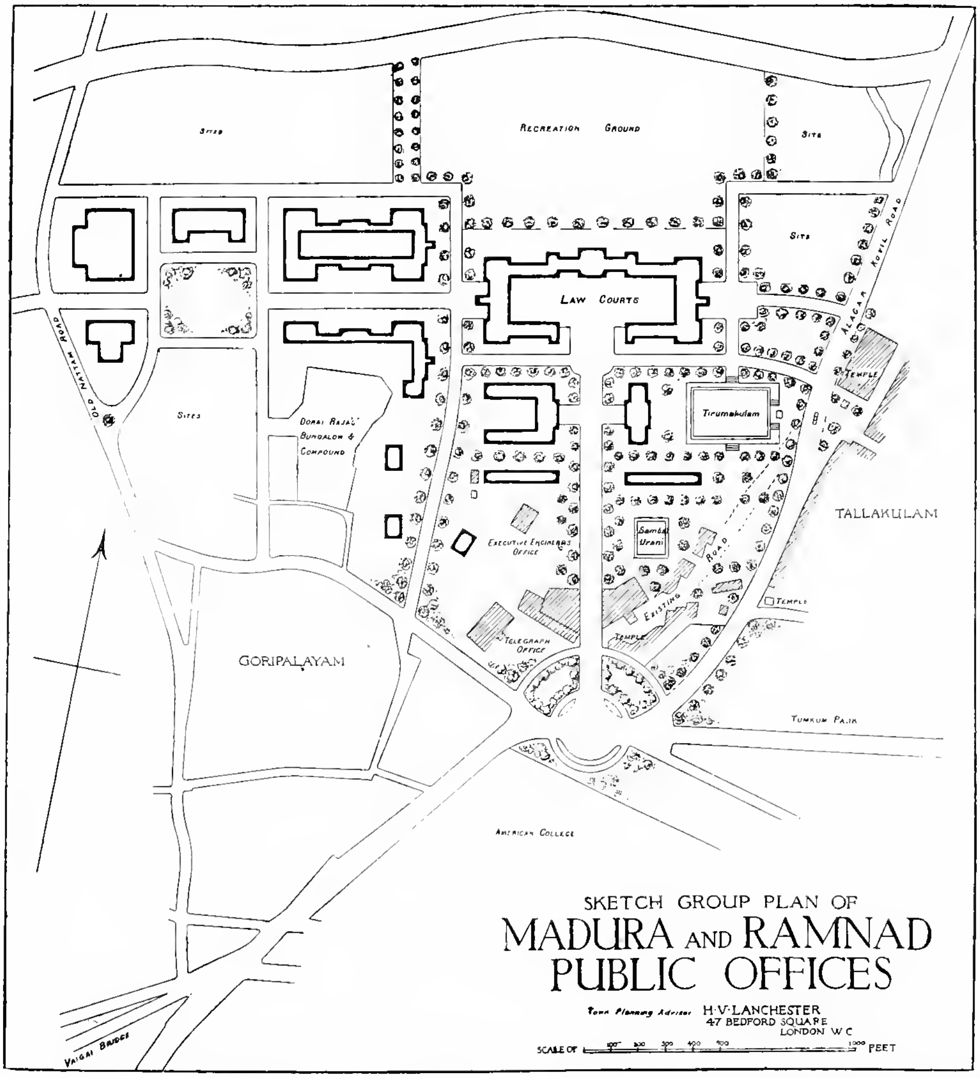
It will be as well to outline the best course for a municipality to take when expropriating householders under a clearance scheme. There are several alternatives. The immediate payment of cash compensation is, for the reasons stated, often unwise. The provision of fresh sites and erection of new houses is rather a costly matter if the new houses are, as they should be, much superior to those removed. In Europe, as the poorer classes rent their houses, it is possible to put up sanitary premises to be let at a suitable rent, but it is better that even the poor should own their dwellings when it is possible. Perhaps the best method is for the municipality to provide a new site, to allow so much of the old buildings as may be portable to be transferred and re-used, and then to pay out the amount allowed as compensation in instalments as the new house is erected. If the householder desires (and in this he should be encouraged) to build a better house, the municipality can lend a further sum, taking a mortgage on the house, this sum to be repayable by the householder in monthly instalments proportioned to the sum so advanced. In all cases the house to be built should be approved by the municipality both as being good in itself and suited to the position of the owner.

This last course is the one most likely to ensure the success of re-housing schemes where those to be re-located are possessed of but small means. Where they are comparatively well-to-do the problem is a simpler one, but it might still be as advisable to take such steps as will ensure the compensation paid being devoted to re-housing in an adequate manner.

Other questions connected with housing having been dealt with in previous Chapter, we may pass on to the consideration of those points which, while they cannot be said to be of more importance, exercise a greater influence on the general impression the city will make, and on its convenience in all matters outside the home.

In making improvements you will recognise as a frequent contributary demand

ALAGAR KOVIL ROAD, MADURA 48



EXAMPLE OF AXIAL LAY-OUT 49

that sites for one or more public buildings are desired, the number of schools may be inadequate, official premises or a town hall may be needed.

Now it is not enough that sites should be found for these, the sites must be convenient, well placed, and if the building is an important one, its dignity and beauty must be so exhibited as to enhance the effect of the district in which it stands.

Now the value of the vista leading to a feature of importance seems to be so well understood in the case of the gopurams of the great temples that it is remarkably strange that this factor in schemes for re-arranging town areas is so uniformly neglected in regard to other buildings.

One very rarely sees a scheme which definitely considers the buildings that may be required to form part of it, with a view to secure to such buildings the advantages of a dominant site. Usually it is seen that people require a school. It is found that this or that is a convenient site for a school. But the school, which is perhaps a little more important than other buildings, is not to be advertised by a more prominent position. It takes its chance as long as it is conveniently placed for those who use it. Many of the public buildings are not more conspicuous than the accidents of the sites suggest. I think that this is a point on which we ourselves in England are neglectful also. We have the reputation of being a practical people, and we do not look at these considerations which are, to a large extent, sentimental ones. The sentiment of public buildings is a thing understood on the Continent far better than in England; and therefore, we have not been much of an encouragement to India in that direction. A Frenchman, for instance, looks at a public building as something to express its character, not only to meet the convenience of the people who resort to it. He says that when you go into a city, you should at once be able to realise which is the Town Hall; and you should realise that the Town Hall is the focal point of the city. (The Town Hall in Europe embraces the municipal offices also, and it is not therefore exactly on the same footing as the Town Hall in India). Then of course there are the theatres. On the Continent these are not purely commercial concerns; they are supported by municipalities; and the theatre becomes thus a public centre and is so placed that the people recognise it at once, by the sculptures upon it, by the design, and by a certain freedom of space around it, that that is a place for public entertainments. One might recapitulate various other buildings—for instance the Law Courts. The Law Courts is entitled the Palace of Justice. Palace of Justice sounds more dignified than Law Courts; and the same idea governs the design. We pass through a large and impressive portal, then step by step through huge halls and up wide staircases till we come to the court itself. It is all designed to impress us as much as possible with the dignity of the law, much in the same way as we put our judges into a long and flowing wig. In England we say it is cheaper and easier to buy a wig for a judge than to build a large and dignified building. Of course an architect—not a wig maker—has a natural preference for the large and dignified building. The vista forms a part of this idea.

Vistas and axial planning may be overdone, but there certainly seems little likelihood of this happening in South India. The vista in the design of a city is the extension of the building plan into the street. The building thus has a definite connection with the symmetry and axiality of the space that surrounds it. (See 48 and 49.)

There is a point to be guarded against; if we are not putting up a large and symmetrical building we must avoid using ambitious decorative designs, embodying squares, straight roads, etc., in the plan, because these really belong to large and important buildings. If we make a great display of road surfaces, and have nothing to put around them but little cottages and small bungalows, we shall find them very disappointing in their effect. The only way to excuse such a course is the provision of formal rows of trees. When laying out an area for small buildings, we do not attempt

grandiose effects such as these; on the other hand when clearing or making an area for important buildings we must not forget to see that the road patterns are an echo of these dignified and important buildings. A public building is not doing its duty unless the approaches display it to advantage from various points of view. When placing a good building, we need to study it not only from one point of view, but from all the points where it may be an object of interest to the part of the city in which it stands.

Then again good buildings may exist already and an improvement scheme in their proximity may enable them to be better viewed, in which case it would obviously be a mistake not to take advantage of the opportunity, if it can be done at a reasonable cost.

In improvement schemes one must have first in view the particular object for which the scheme is prepared—whether it is for the opening up of congestion or whether it is to be for traffic or something else. We should certainly make the best of every building, not only public building, but every good building that comes into it. If we find a particularly good house, we can perhaps devise our scheme or alter it a little in order to bring this house into more prominence.

Then we have various economic questions to think of, such as railways, markets, factories, etc., water carriage, and advantages of double levels with regard to transport. The introduction of railway facilities very often demands alteration in a portion of the city. The town has been designed, as nearly all our towns are designed, for goods to arrive by radiating roads coming from various parts of the country. This state of things is altered by bringing in the railway, whereby a great portion of the goods brought into the town are brought to a definite point (namely, the railway station), and this entirely changes the old conditions. The things that come to the centre of the town or a portion of the town, instead of being brought in from all round, are distributed from one point. This very often means the remaking of the traffic diagram of the town.

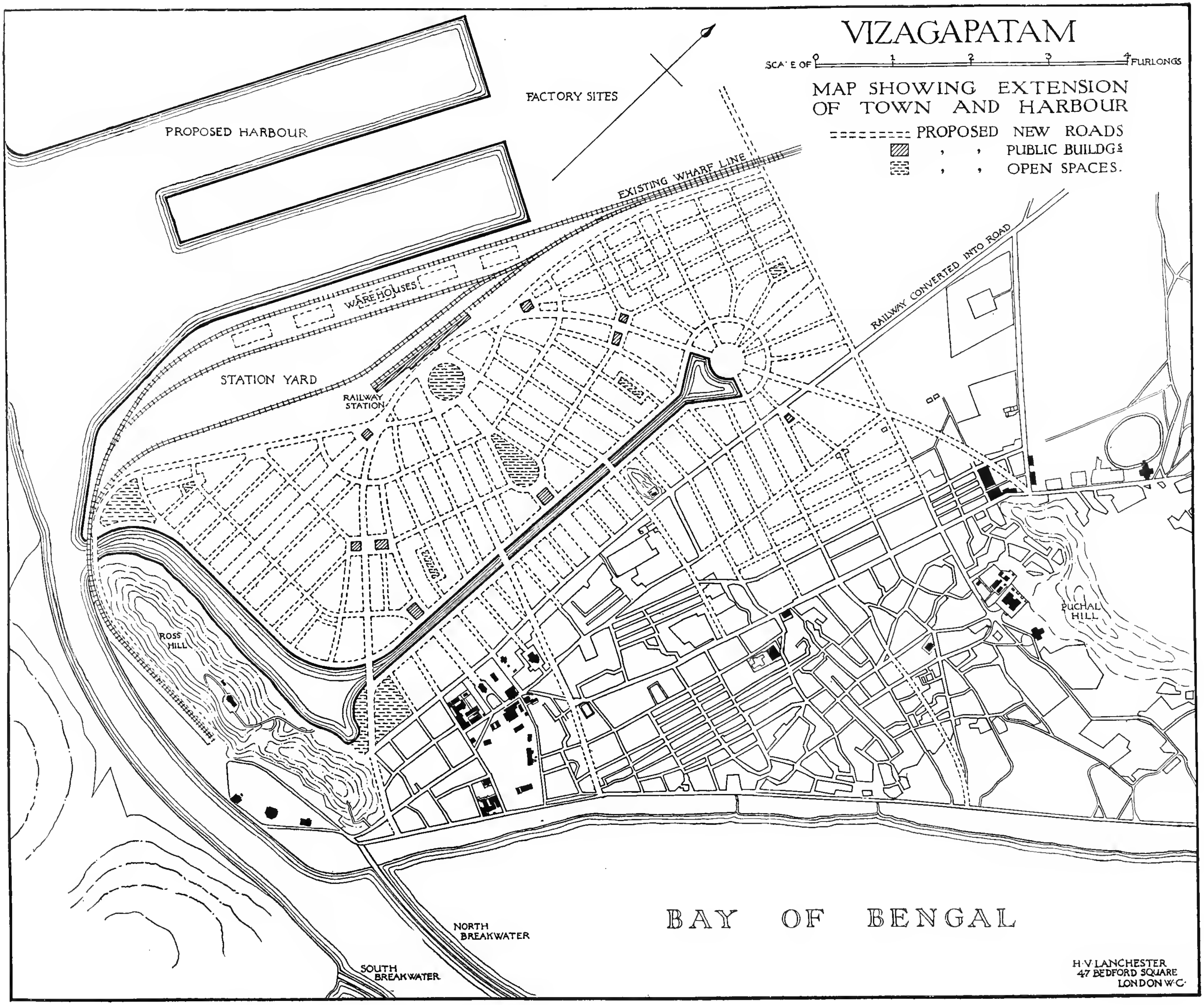
In this case the obvious course is to lay out our schemes so that the town is properly served from one point instead of, or as well as, being served from a number of outside areas.

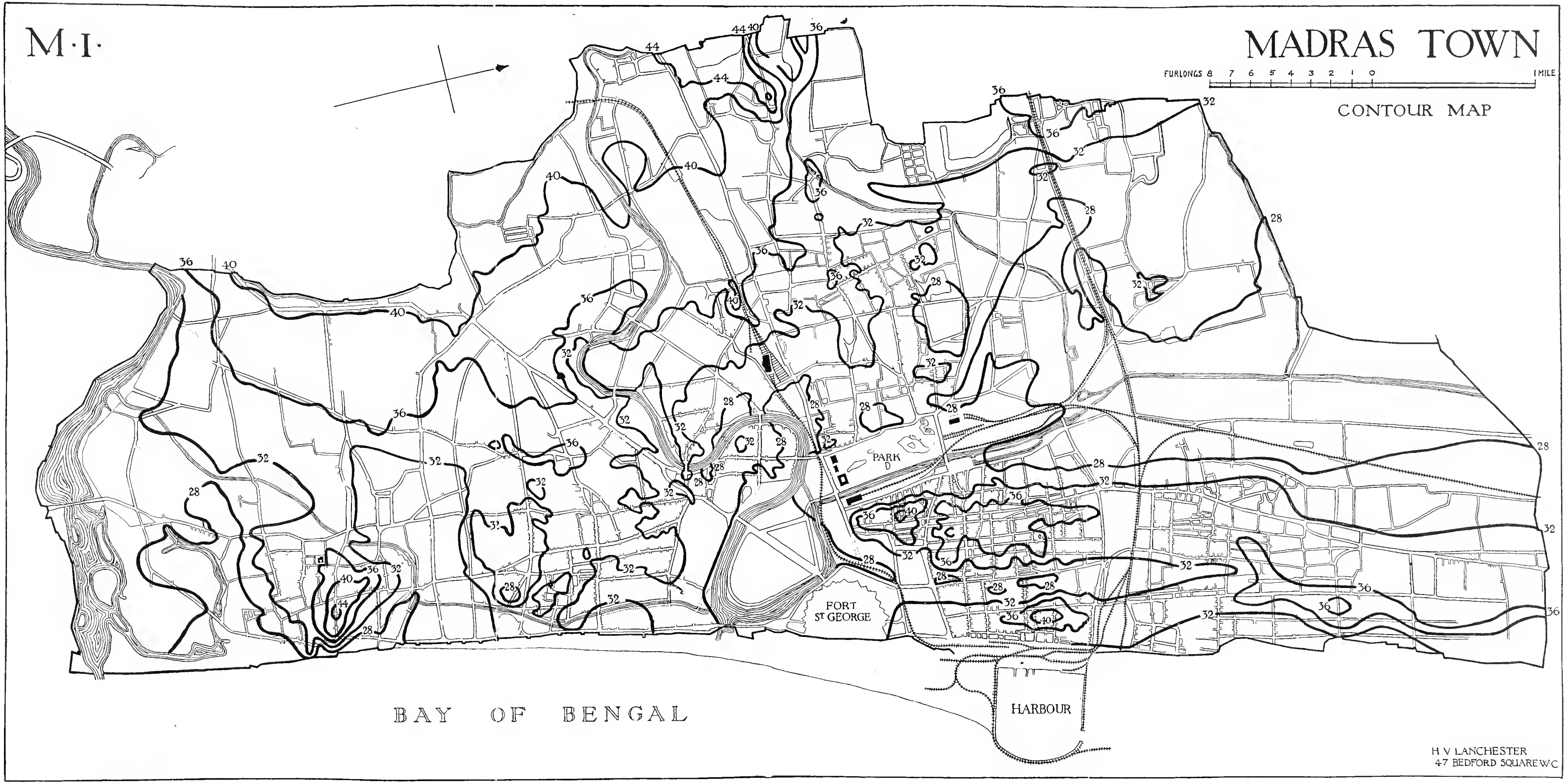
Then of course there are the factories. This factor, strictly speaking, only comes under the head of the improvement scheme in that we must try and avoid a wasteful traffic between factories, and their sources of supply, and their route of delivery. If a factory depends upon the railway, we must scheme our roads so that they give easy access to the railway area. As to markets we must take the same course. Markets must be easily accessible for the goods brought into them, either by road or rail, and conveniently placed for the people who purchase there.

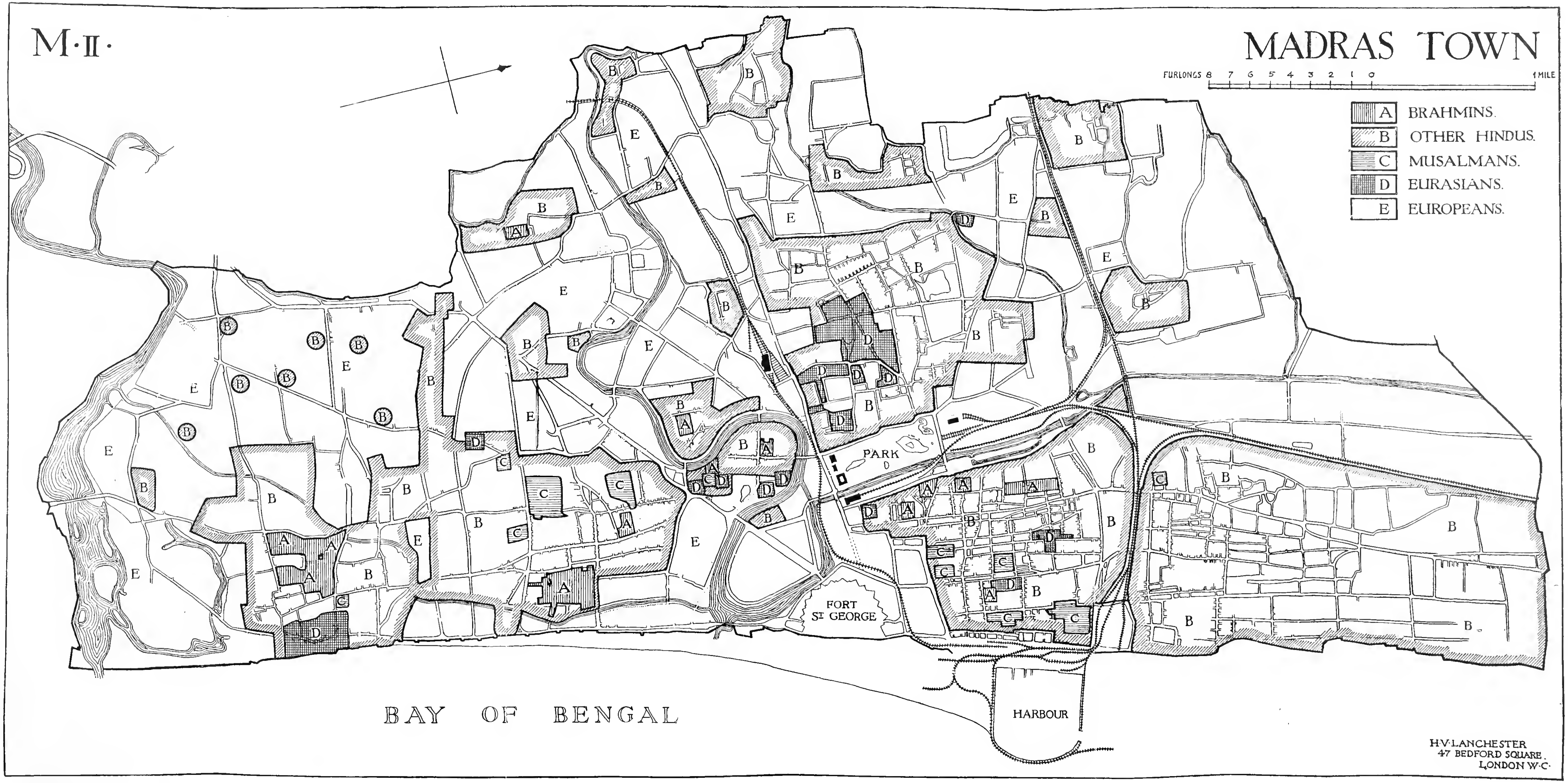
The question of water carriage arises in certain cases. Let us remember what the Dutch did with respect to water carriage; they had low lying sites, nearly all Holland is, if not actually below, certainly not above, the sea level. They made canals a part of their reclamation schemes and they use canals throughout their cities as a means of transport, effecting thereby very great economy. (See illustration 50). There are two advantages in a canal. Not only in the cheapness of water transport but as providing transport at two levels. Goods can be brought in by boats; placed in a warehouse and distributed by road in small quantities so that import is, as it were, entirely distinct and separate from export. That is a very convenient system. There are one or two coalyards in England in which the coal is brought in trucks at some twenty feet above the road level and dropped into bins and discharged into carts so that from the point of view of levels the coal brought in has got its own floor independent of delivery. Again in London we have a large produce supply market which is largely

NIEUW WESTERYK DOK
NIEUW OOSTELYK DOK
S RYKS MARATIME DOK
S. RYKS ENTREPOT DOK
DE NIEUWE VAART
PLANTAGIE
DAM RACK
AMSTEL

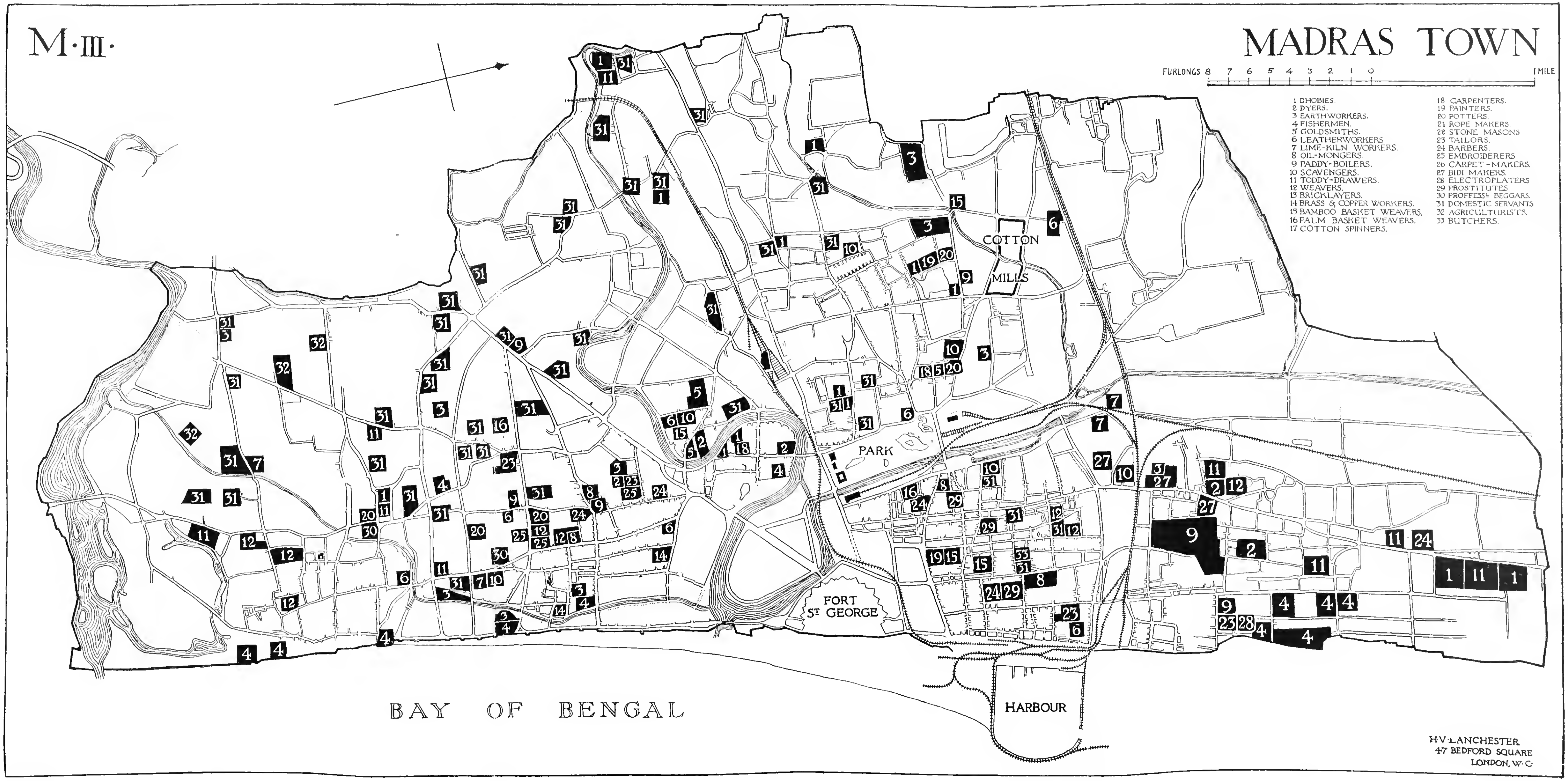
AMSTERDAM


VIZAGAPATAM
SCALE OF 0 1 2 3 4 FURLONGS
MAP SHOWING EXTENSION OF TOWN AND HARBOUR
PROPOSED NEW ROADS
" " PUBLIC BUILDGS
" " OPEN SPACES.
PROPOSED HARBOUR
FACTORY SITES
EXISTING WHARF LINE
WAREHOUSES
STATION YARD
RAILWAY STATION
RAILWAY CONVERTED INTO ROAD
ROSS HILL
PUCHAL HILL
BAY OF BENGAL
NORTH BREAKWATER
SOUTH BREAKWATER
H·V·LANCHESTER
47 BEDFORD SQUARE
LONDON W·C·

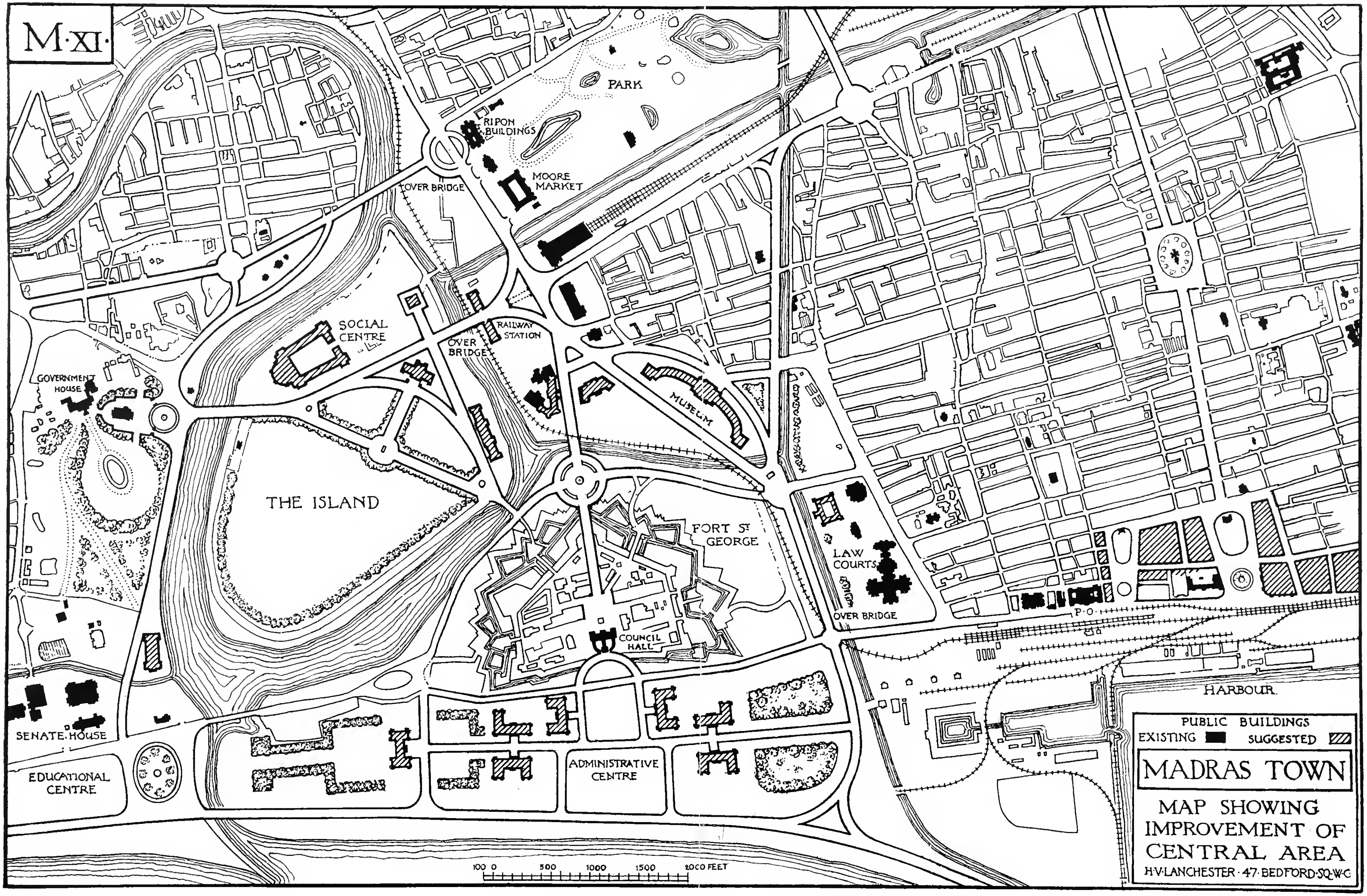

M·I·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0 1 MILE
CONTOUR MAP
PARK
FORT St GEORGE
HARBOUR
BAY OF BENGAL
H V LANCHESTER
47 BEDFORD SQUARE W.C.

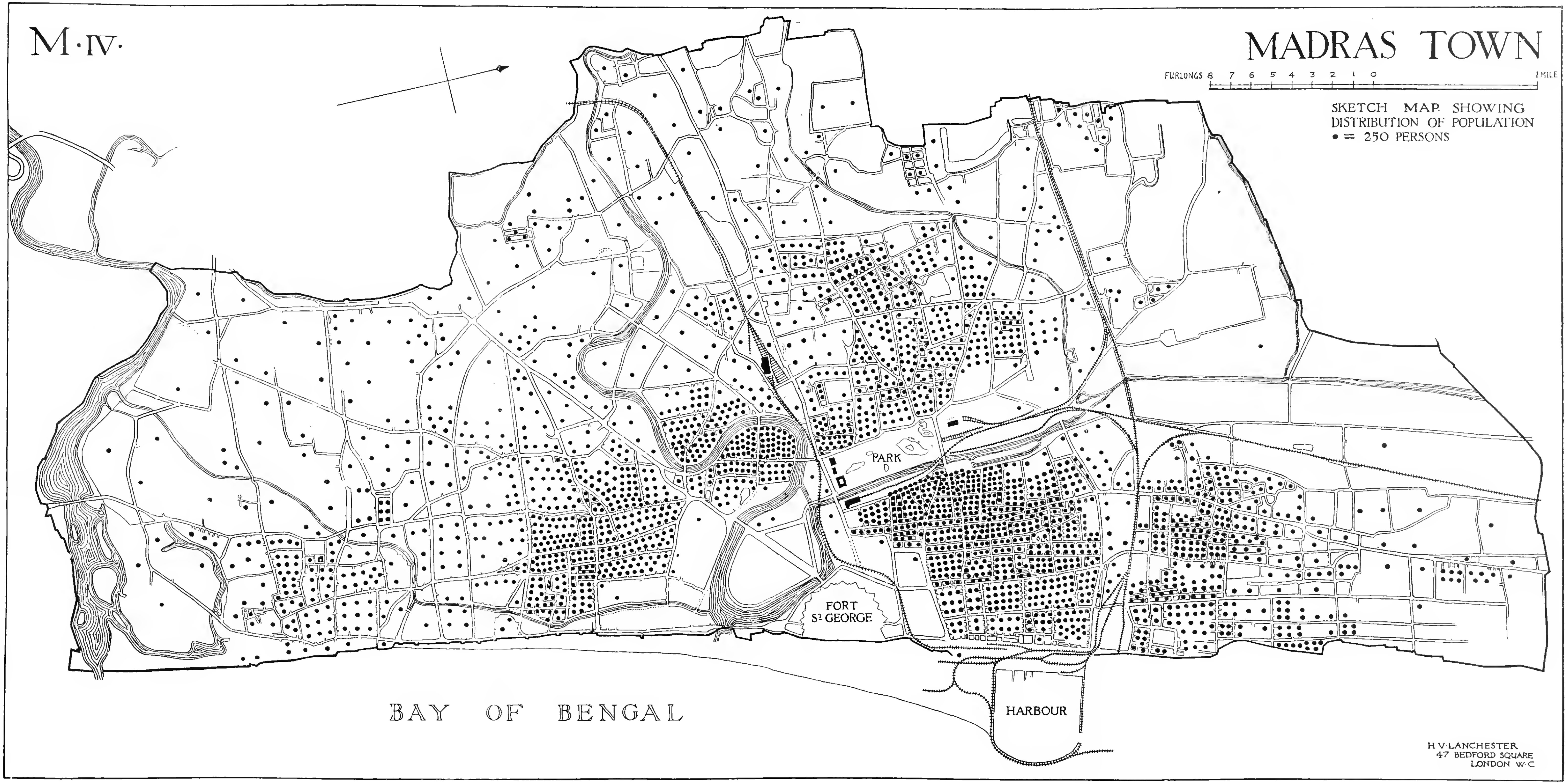


M·II·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0
1 MILE
A BRAHMINS.
B OTHER HINDUS.
C MUSALMANS.
D EURASIANS.
E EUROPEANS.
PARK
FORT ST GEORGE
HARBOUR
BAY OF BENGAL
H·V·LANCHESTER
47 BEDFORD SQUARE.
LONDON W·C·

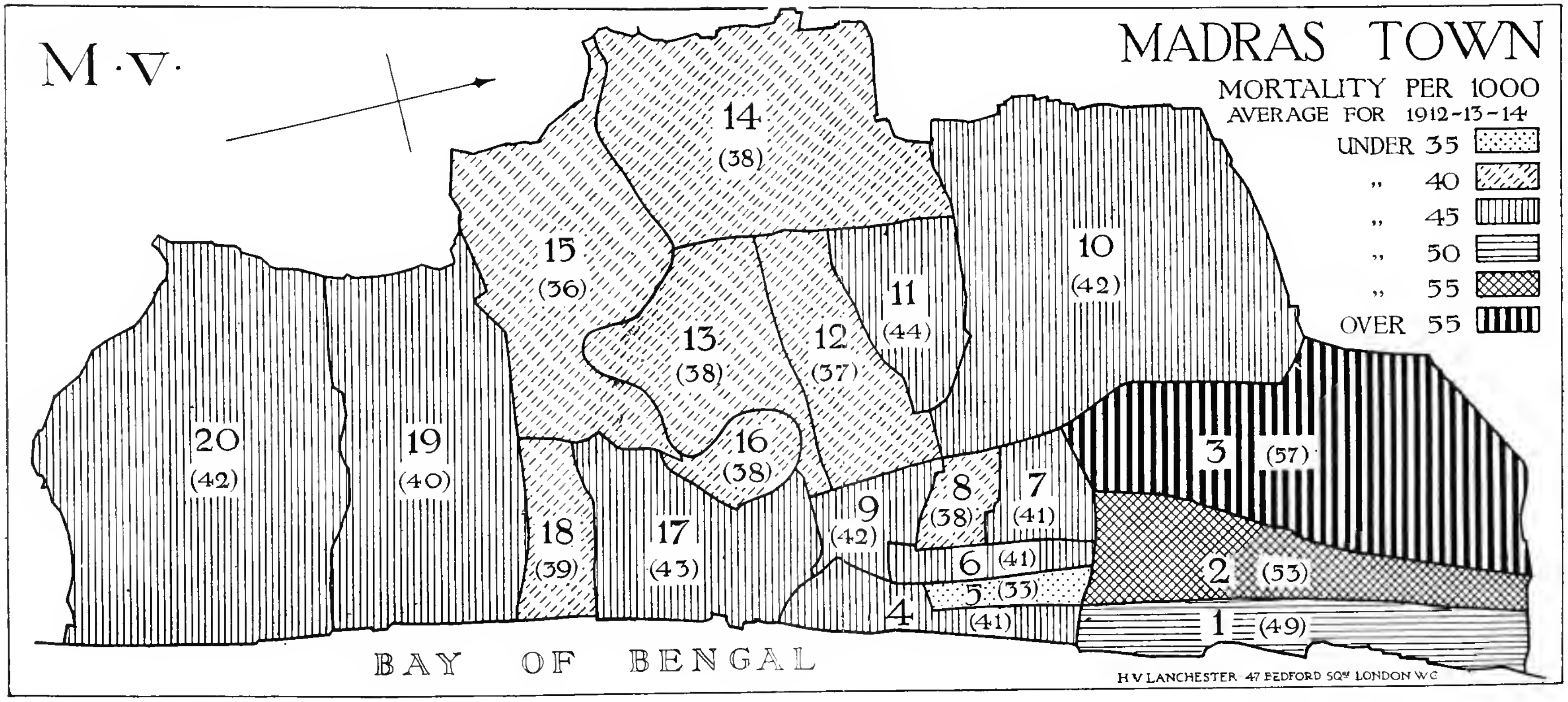


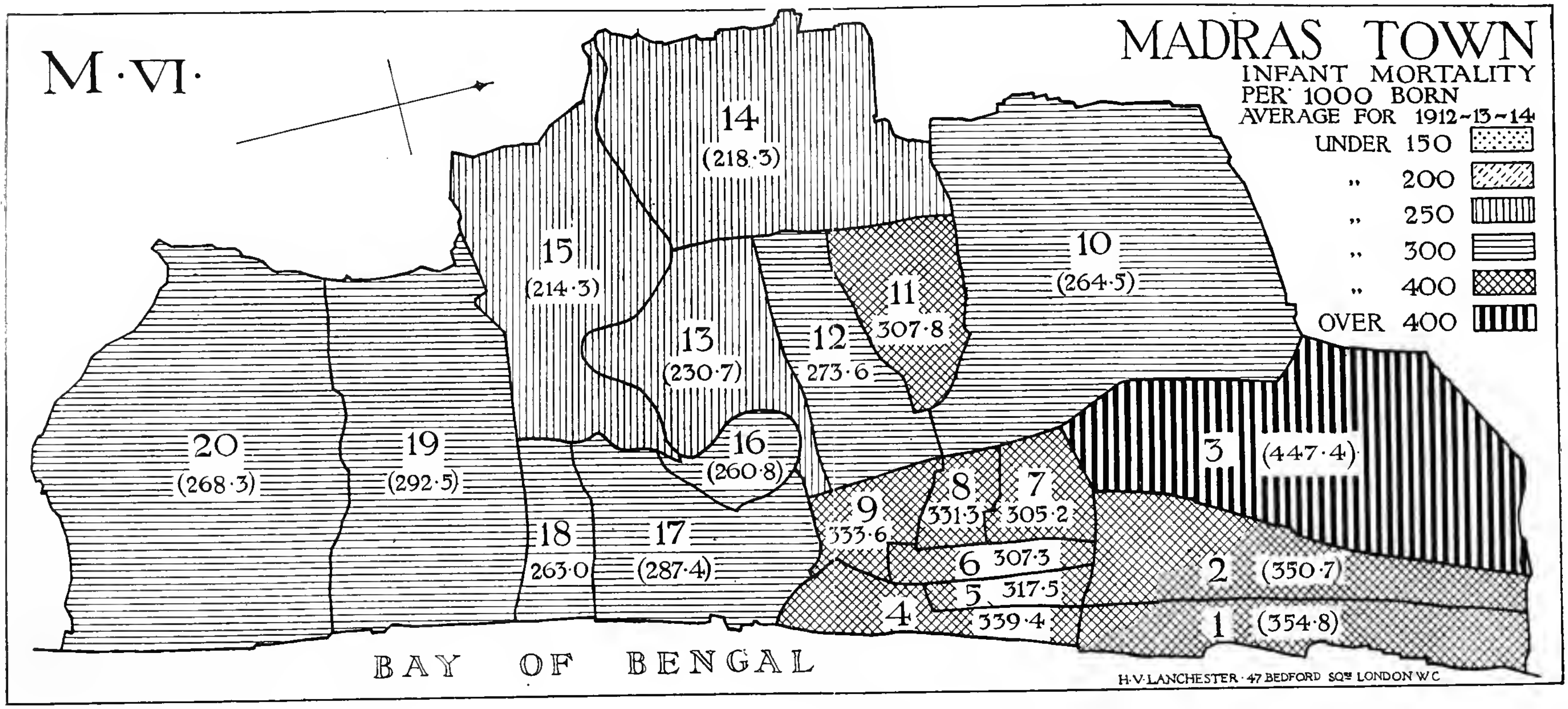
M·III·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0 1 MILE
1 DHOBIES.
2 DYERS.
3 EARTHWORKERS.
4 FISHERMEN.
5 GOLDSMITHS.
6 LEATHERWORKERS
7 LIME-KILN WORKERS.
8 OIL-MONGERS.
9 PADDY-BOILERS.
10 SCAVENGERS.
11 TODDY-DRAWERS.
12 WEAVERS.
13 BRICKLAYERS.
14 BRASS & COPPER WORKERS.
15 BAMBOO BASKET WEAVERS.
16 PALM BASKET WEAVERS.
17 COTTON SPINNERS.
18 CARPENTERS.
19 PAINTERS.
20 POTTERS.
21 ROPE MAKERS.
22 STONE MASONS
23 TAILORS.
24 BARBERS.
25 EMBROIDERERS
26 CARPET-MAKERS.
27 BIDI MAKERS.
28 ELECTROPLATERS
29 PROSTITUTES
30 PROFFESSL BEGGARS.
31 DOMESTIC SERVANTS
32 AGRICULTURISTS.
33 BUTCHERS.
COTTON MILLS
PARK
FORT ST GEORGE
HARBOUR
BAY OF BENGAL
H·V·LANCHESTER
47 BEDFORD SQUARE
LONDON, W·C·

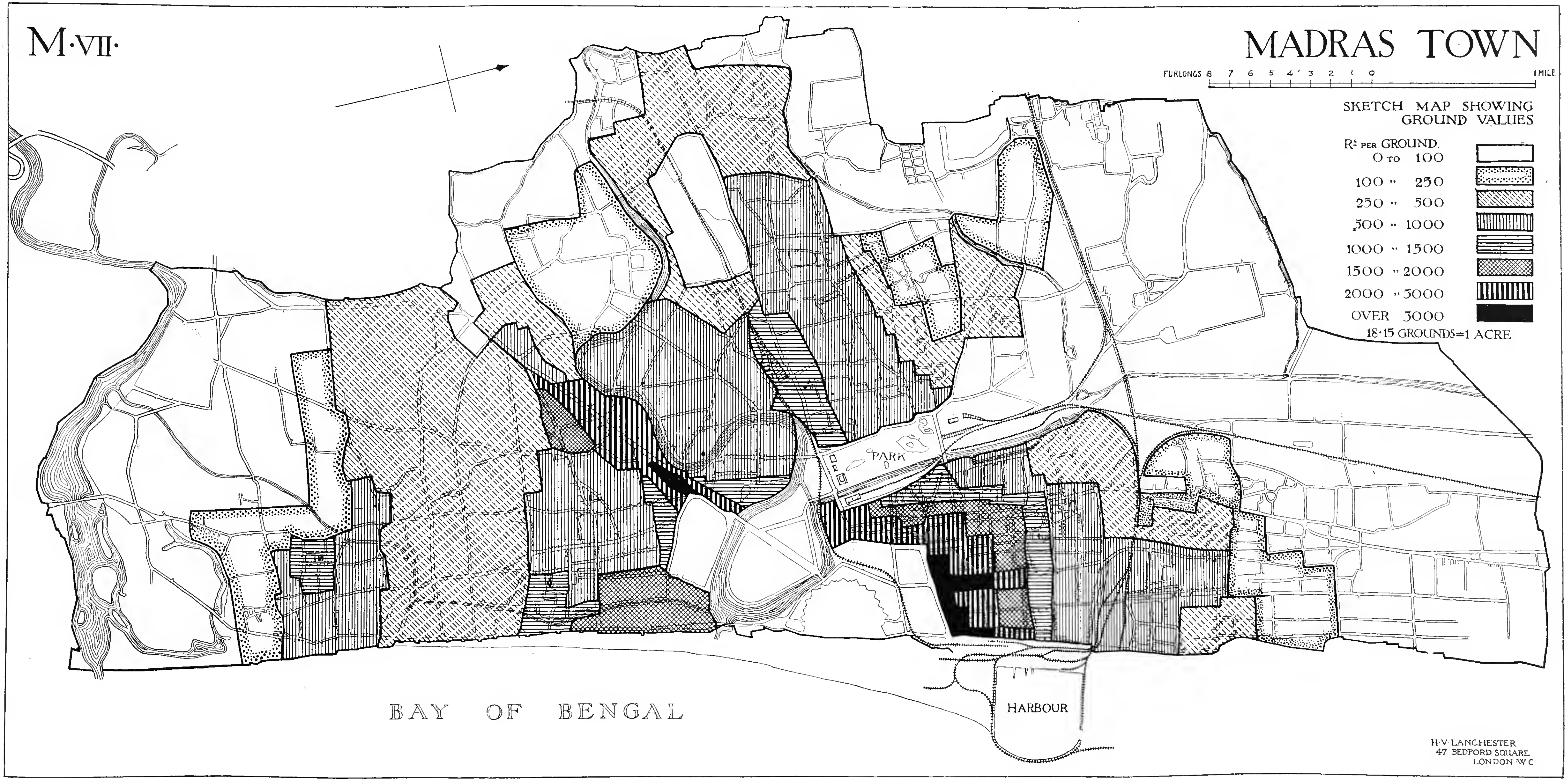

M·XI·
PARK
RIPON BUILDINGS
MOORE MARKET
OVER BRIDGE
SOCIAL CENTRE
RAILWAY STATION
OVER BRIDGE
GOVERNMENT HOUSE
MUSEUM
THE ISLAND
FORT St GEORGE
LAW COURTS
OVER BRIDGE
P.O.
COUNCIL HALL
HARBOUR.
SENATE·HOUSE
EDUCATIONAL CENTRE
ADMINISTRATIVE CENTRE
PUBLIC BUILDINGS
EXISTING
SUGGESTED
MADRAS TOWN
MAP SHOWING IMPROVEMENT OF CENTRAL AREA
H·V·LANCHESTER · 47· BEDFORD·SQ·W·C
100 0 500 1000 1500 2000 FEET

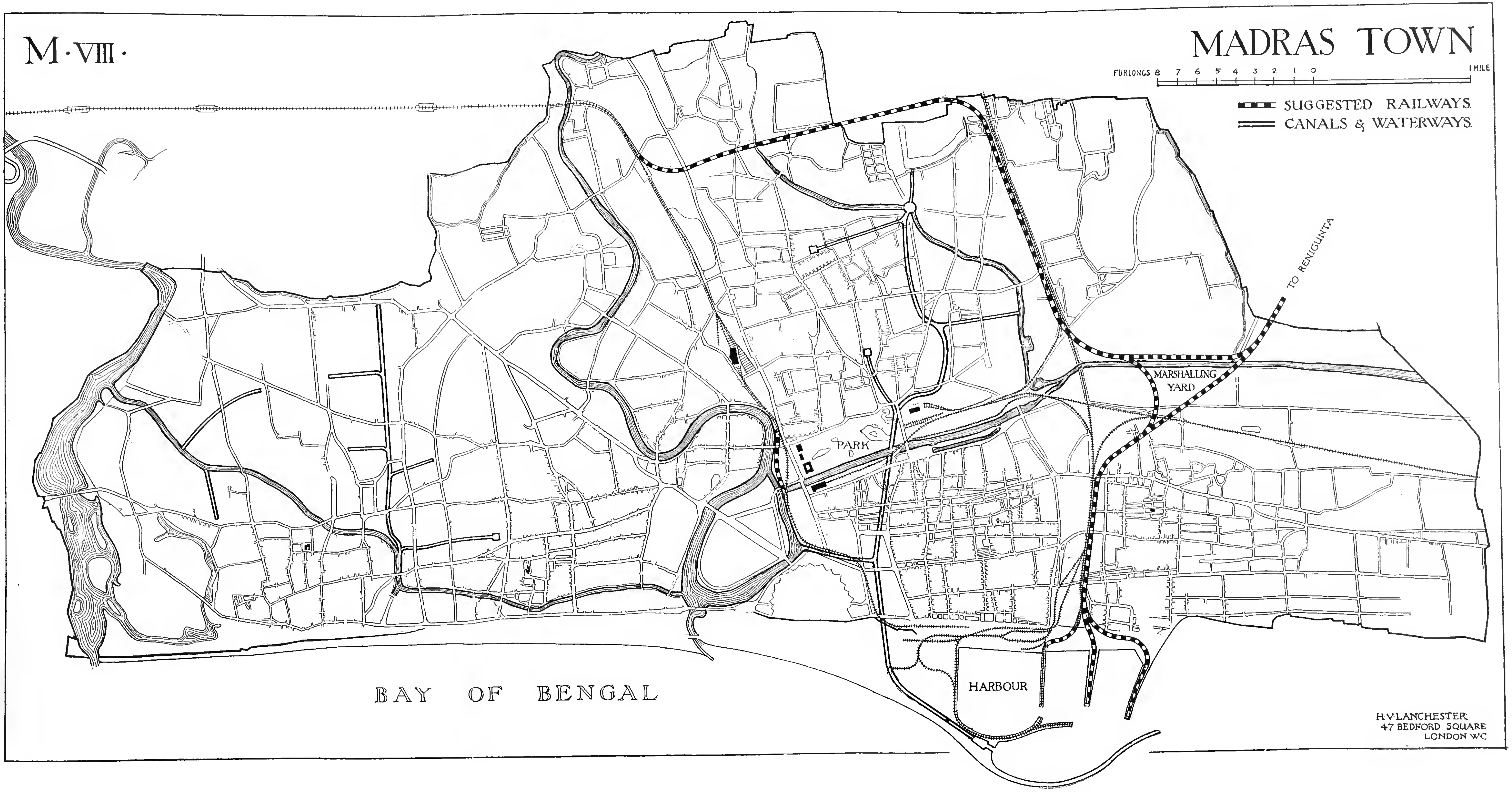


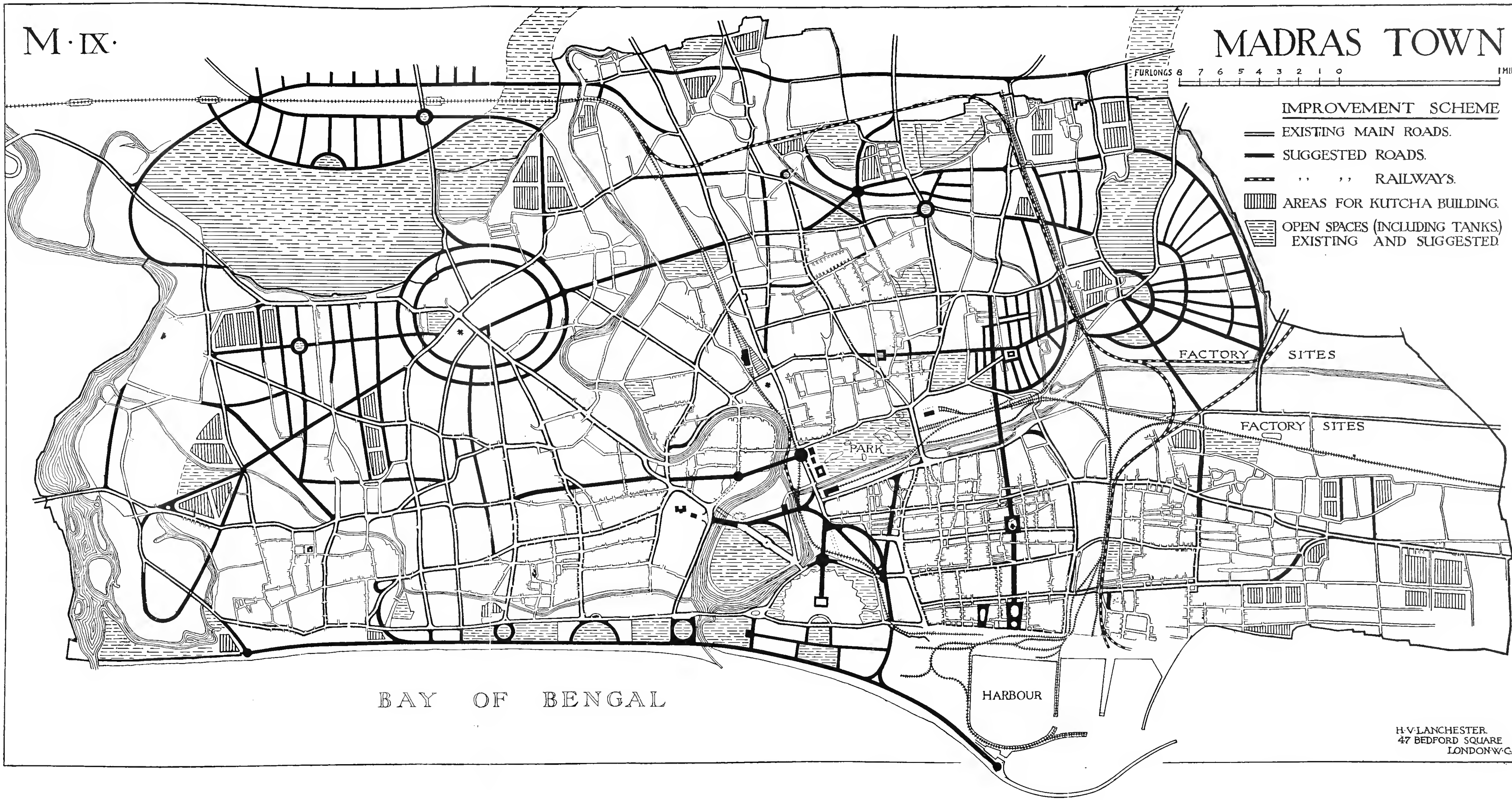
M·IV·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0 1 MILE
SKETCH MAP SHOWING
DISTRIBUTION OF POPULATION
• = 250 PERSONS
PARK
FORT
St GEORGE
HARBOUR
BAY OF BENGAL
H V LANCHESTER
47 BEDFORD SQUARE
LONDON W C

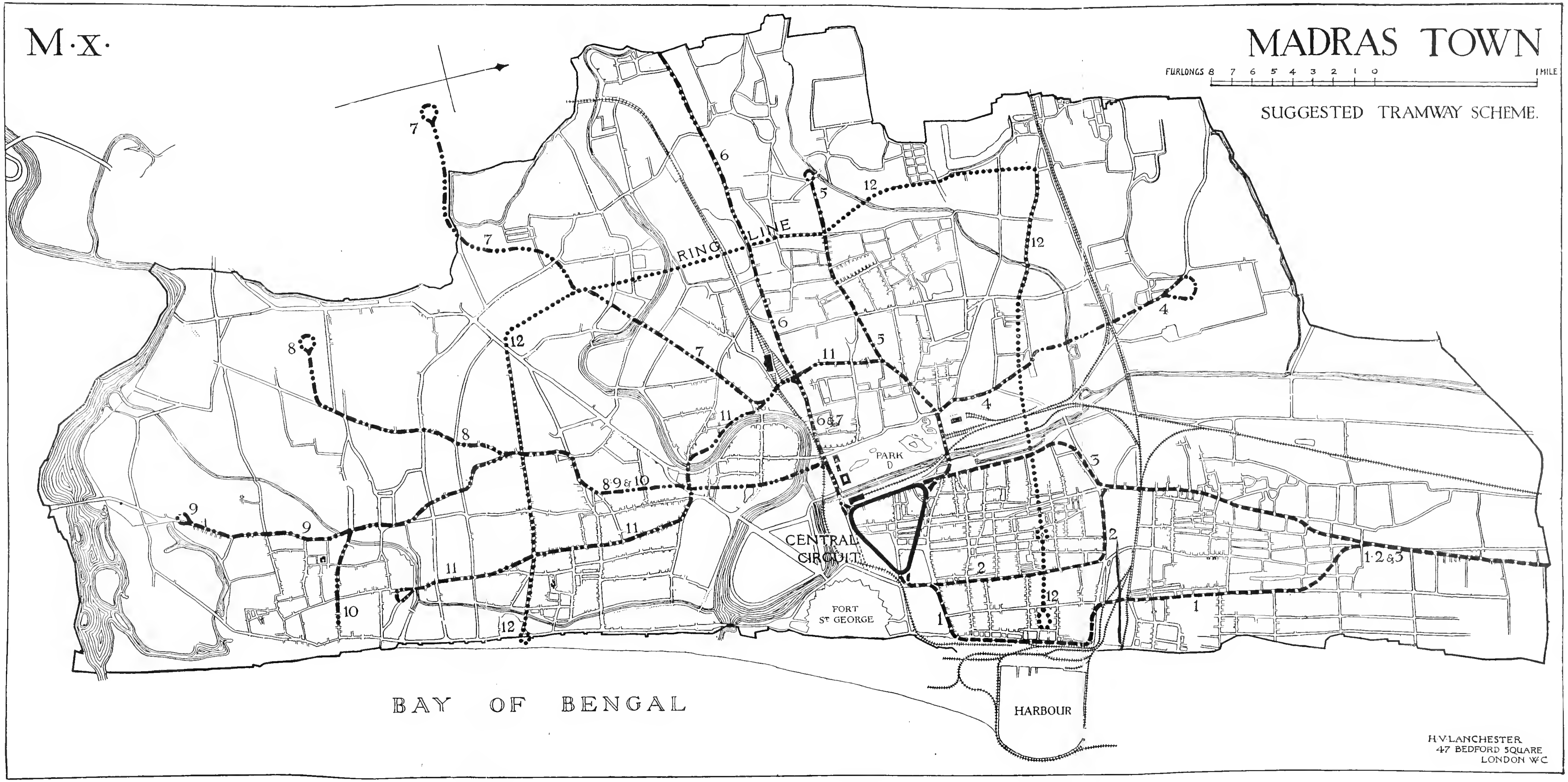

M·V·
MADRAS TOWN
MORTALITY PER 1000
AVERAGE FOR 1912-13-14
UNDER 35
„ 40
„ 45
„ 50
„ 55
OVER 55
14 (38)
15 (36)
13 (38)
12 (37)
11 (44)
10 (42)
16 (38)
20 (42)
19 (40)
18 (39)
17 (43)
9 (42)
8 (38)
7 (41)
6 (41)
5 (33)
4 (41)
3 (57)
2 (53)
1 (49)
BAY OF BENGAL
H.V LANCHESTER 47 BEDFORD SQ[RE] LONDON W.C

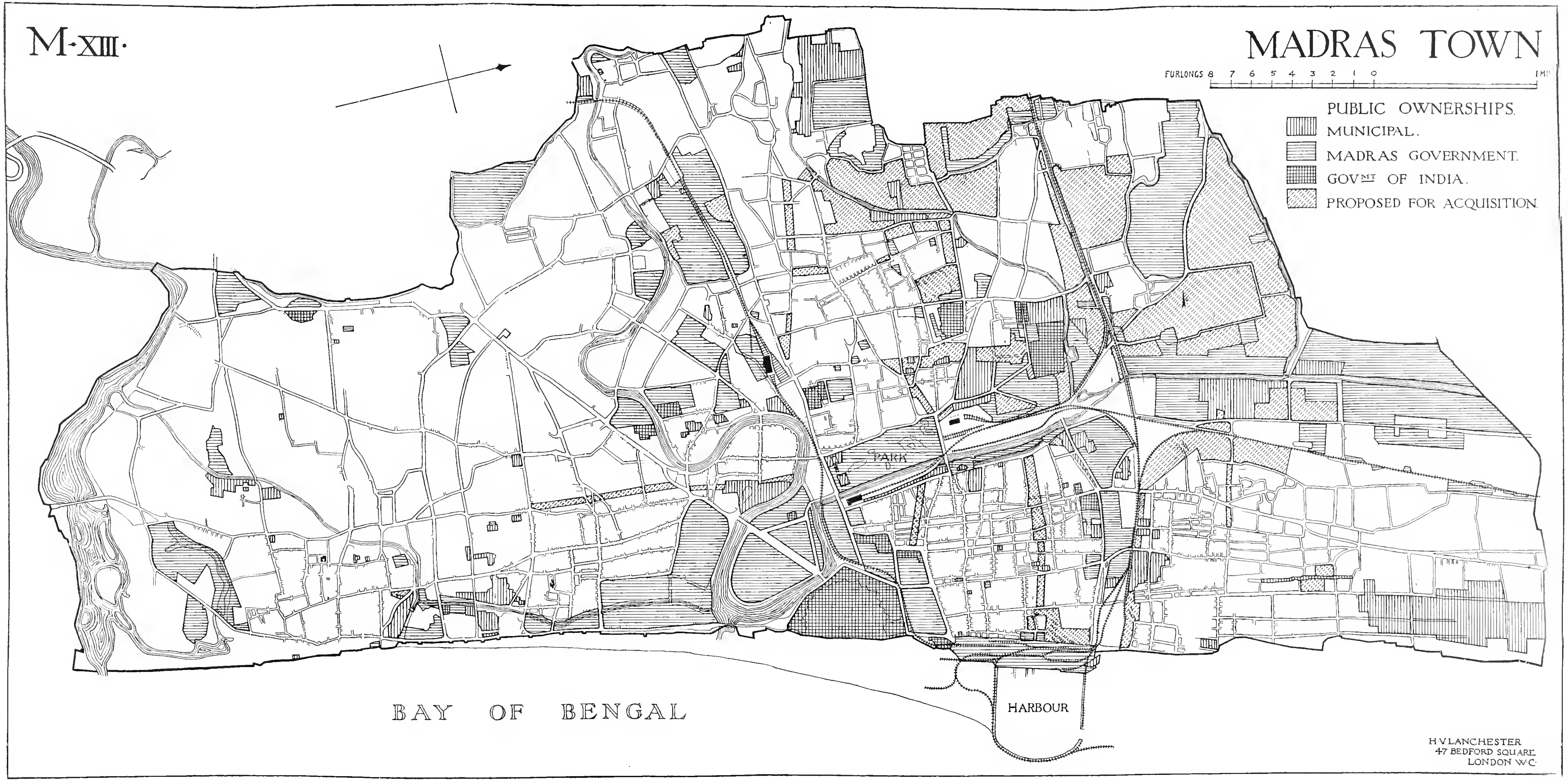

M·VI·
MADRAS TOWN
INFANT MORTALITY
PER 1000 BORN
AVERAGE FOR 1912-13-14
UNDER 150
„ 200
„ 250
„ 300
„ 400
OVER 400
14 (218·3)
15 (214·3)
13 (230·7)
12 273·6
11 307·8
10 (264·5)
16 (260·8)
20 (268·3)
19 (292·5)
18 263·0
17 (287·4)
9 333·6
8 331·3
7 305·2
6 307·3
5 317·5
4 339·4
3 (447·4)
2 (350·7)
1 (354·8)
BAY OF BENGAL
H.V.LANCHESTER · 47 BEDFORD SQ[RE] LONDON W.C


M·VII·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0
1 MILE
SKETCH MAP SHOWING
GROUND VALUES
Rs PER GROUND.
0 TO 100
100 " 250
250 " 500
500 " 1000
1000 " 1500
1500 " 2000
2000 " 3000
OVER 3000
18·15 GROUNDS=1 ACRE
PARK
HARBOUR
BAY OF BENGAL
H·V·LANCHESTER
47 BEDFORD SQUARE
LONDON W C


M·VIII·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0
1 MILE
SUGGESTED RAILWAYS
CANALS & WATERWAYS
TO RENIGUNTA
MARSHALLING YARD
PARK
HARBOUR
BAY OF BENGAL
H.V. LANCHESTER
47 BEDFORD SQUARE
LONDON W.C.


M·IX·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0
1 MILE
IMPROVEMENT SCHEME
EXISTING MAIN ROADS.
SUGGESTED ROADS.
,, ,, RAILWAYS.
AREAS FOR KUTCHA BUILDING.
OPEN SPACES (INCLUDING TANKS) EXISTING AND SUGGESTED
FACTORY SITES
FACTORY SITES
PARK
HARBOUR
BAY OF BENGAL
H·V·LANCHESTER
47 BEDFORD SQUARE
LONDON·W·C


M·X·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0 1 MILE
SUGGESTED TRAMWAY SCHEME.
RING LINE
CENTRAL CIRCUIT
PARK
FORT ST GEORGE
HARBOUR
BAY OF BENGAL
8·9 & 10
6 & 7
1·2 & 3
H.V. LANCHESTER
47 BEDFORD SQUARE
LONDON W.C.


M·XIII·
MADRAS TOWN
FURLONGS 8 7 6 5 4 3 2 1 0 1 MI
PUBLIC OWNERSHIPS.
MUNICIPAL.
MADRAS GOVERNMENT.
GOVMT OF INDIA.
PROPOSED FOR ACQUISITION.
PARK
BAY OF BENGAL
HARBOUR
H V LANCHESTER
47 BEDFORD SQUARE
LONDON W.C.

supplied by railway sidings below the surface. These are special cases, but double level transport may often be found very convenient as a means of avoiding traffic difficulties. It is therefore as well to realise the advantages of having one level for bringing in goods and another level for sending them out. Let us keep that system in mind because one of these days it may be a very useful means for getting rid of traffic congestion.

In remodelling a city we must guard against being influenced by effects, legitimate enough elsewhere, but unsuited to the traditions and requirements. Improvements should partake of the character of the existing streets of the town. We find plenty of excuses not to make our streets too straight and regular; we find difficulties in cutting new roads, perhaps important buildings stand on the way. In laying down the general line of a street we may find that there are obstacles affording excuse for divergencies, sometimes there are numerous temples which no one wants to disturb, so that we may get interesting accidental features in the new roads, and while we allow for the ordinary possibilities of traffic, we can prevent the streets from looking as if they were hacked through the town, and encourage them rather to take their natural place in the general scheme. We don't want to feel that we have an old town wrecked, but rather an old town which has been made the best of.

May we not hope to see some man of artistic qualifications settling down in a city and devoting himself absolutely to that city only. The expert running about, looking at one city after another, and trying to think out what is best for this city and that city is apt to be distracted and cannot always arrive, on the spur of the moment, at absolutely the best solution. The resident thinking over each problem of the city, bit by bit, may see what is within the range of practicability and achieve for that city more than anything that could possibly be done by the casual visitor. It may be pointed out that this was more or less the way in which the mediæval cities in Europe were treated. Everybody knows that travelling was not so convenient in these times and that all were particularly interested in making their city look its best. The secret of the beauty of the mediæval town was not that it was skilfully planned but that every opportunity and every incident was made the best of, owing to the interest and devotion that people gave to the work they carried out within it.

By this means exotic and artificial ideals are avoided, while of course anything logically or financially extravagant will be checked by the expert staff having behind it the data of the civic survey.

Chapter IX.

INDIAN AND EUROPEAN CITIES.

A comparison between the cities of India and those of Europe, pointing out the differences between them, would be of little service were it not that the study of these differences is of great value in offering a broader outlook in regard to the possibilities of city design, not necessarily by the introduction of European methods but rather by the opportunity it offers for seeing India itself more vividly.

It has been said: " What do they know of England who only England know," and the same idea applies equally to other countries and other nations—therefore it is as well that many, comprehensive though their general knowledge of Europe may be, should be enabled to carry away a somewhat more vivid impression of the methods and ideals of the growing cities of Europe.

To begin with, while many Indian cities vie in antiquity with those of Europe, it may be noted that the existing city in Europe is on the average more stable than that in India. Though some have declined there are but few deserted cities such as are not infrequent in the east. Despite wars and catastrophies almost all the places that show prominently in the history of the last 2,000 years are going " concerns " to-day. While what is the case when we review Indian history for 2,000 years ? Some of the glorious cities of the past exist but in name, others are inhabited only by the goats and the bats. There must be a reason for this—even if one fails to find it, it seems worth seeking. Dynasties have risen and fallen in Europe as in India. The cities of Europe have stayed, in India they have gone with the dynasty.

May it not be that the European city was located by economic needs, the Indian perhaps more by imaginative caprice. One feels sometimes that the Indian potentate built his city as an artist would paint a picture. In roving over his possessions some site or other seized on his imagination as the basis of a scheme of beauty such as the European never dreamed of—strenuously he set to work to realise his vision, and, perhaps at the cost of a continuing economic strain, his race maintained and developed his undertaking. But once the guiding effort was removed there was no security for its permanence. European cities have been destroyed, but they have persisted. Indian cities once gone rarely seem to revive.

This cannot be due to changed conditions. Conditions in India have changed far less than in Europe. The introduction of the European element has certainly had nothing to do with it, in fact it has not been directly responsible for the disappearance of any place of importance.

At the moment the reason suggested seems the only one to be offered, and yet we would like to find one more conclusive. It is impossible to help feeling that the Indian regards the lapse of a great city with more equanimity than would be felt in Europe, perhaps the influence of his religious teaching so definitely pointing away from materialism towards spirituality may be the secret—and yet it is doubtful if this can be the sole reason—only these few tentative hints may be ventured on here. The European city being more firmly rooted is naturally more uniformly substantial, not merely as regards its buildings ; this might well be doubted, if one came to average up all classes of structure. No, what may be inferred is that there is a constant polishing up and various forms of adaptation always going on with a view to maintaining the city, as a

working machine at a high level; some of these efforts may be mistaken, some of them even vicious in their effects, but the effort is there.

Now it is this lack of continued effort that we note in the Indian town, which is apt to look too much as if its inhabitants had doubts of its continuance, or if this or that little thing is hardly worth while in view of the fact that the city might take wings like so many of its predecessors, leaving behind, perhaps, only the fine temple to testify to its former greatness. We may think this a little fanciful, but possibly these wayward impressions may give you a hint or two as to the differences between India and the West.

That Hindu cities were planned with great care the following quotations from Mr. E. B. Havell (taken from the translations of Ram Raz and others) will amply prove. "It will probably be a revelation to modern architects to know how scientifically the problems of town planning are treated in these ancient Indian Architectural treatises. Beneath a great deal of mysticism, which may be scoffed at as pure superstition, there is a foundation of sound common sense and scientific knowledge which would appeal to the mind of the European.

"For choosing the site of a village, the Mânasâra Silpasâstra declares that a careful examination of its position and soil is first necessary. The best site is that which slopes towards the east, so as to get the full benefit of the first rays of the morning sun; those who have cultivated an Indian garden will appreciate the truth of this axiom. It should be near a stream running from left to right— the auspicious direction in which the sun moves across the sky—and the well digger should be able to find water at a depth of about 7 feet.

"The soil must be tested by its colour, smell, taste, appearance, and feel. Four different qualities were recognised—the first would be firm, of an agreeable odour, suitable for growing various kinds of shade and fruit trees, vegetables and flowers. Sites to be avoided were those inclined to the intermediate points, as N.E.—N.W., stony ground, that in which human graves, disused wells, or refuse of any kind were found.

"A rough practical means of testing the soil for the foundations was to dig a pit (one hasta in depth) and then return the excavated soil into it. A stable foundation would be indicated by the soil at the top being higher than it was before; an indifferent one, if it were on the same level; a bad one, which must on no account be used, if the surface lower."

Then follow some instructions as to how the site is to be prepared. These are mainly ceremonial and we will pass over them.

"The true position of the cardinal points having been carefully ascertained by means of the shadow of a gnomon, rules for the construction of which are given in Silpa-sâstras, the alignment of the main street of the village was marked out. The general plan of the larger villages followed that of the cosmic cross, and the so-called magic square, representing the four quarters of the universe; but the reader must not misunderstand this association of mysticism with the practical business of the Indian craftsman. All art in ancient India was held to be magic, and the magic virtues of these figures simply lay in the fact that the experience of many generations had proved that they were best for purposes of defence and gave the most healthy, pleasant, and practical lay-out for an Indian village or town. The easterly axis of the plan ensured that principal streets were purified by the rays of the sun sweeping through them from morning till evening; while the intersection of main streets by shorter ones running north and south provided a perfect circulation of air and the utmost benefit of the cool breezes."

"The two principal streets which formed the arms of the cosmic cross were broad avenues, probably planted with umbrageous trees. The long one, running east and west, was called the Rajapatha—King's Street; the short one, which pointed north and south, was Mahakala—Broad Street, or otherwise Vamana, South Street—from the name of the mythical elephant which represented the south quarter. The road or wide running path running round the village inside the wall or stockade was called Mangala-vithi—the way of auspiciousness, or Good Fortune; this being the path by which the village priests went daily in the performance of the rite of *pradakshina*, or circumambulation."

"The centre of the village, at the intersection of the two main streets, was the recognised meeting place for the Council of Elders which regulated local affairs. A banyan or a pipal tree planted on a mound sufficed for the mote-house or assembly-hall, except where the village was a large one, and could afford a pillared mandapam, or a pavilion of wood, brick, or stone.

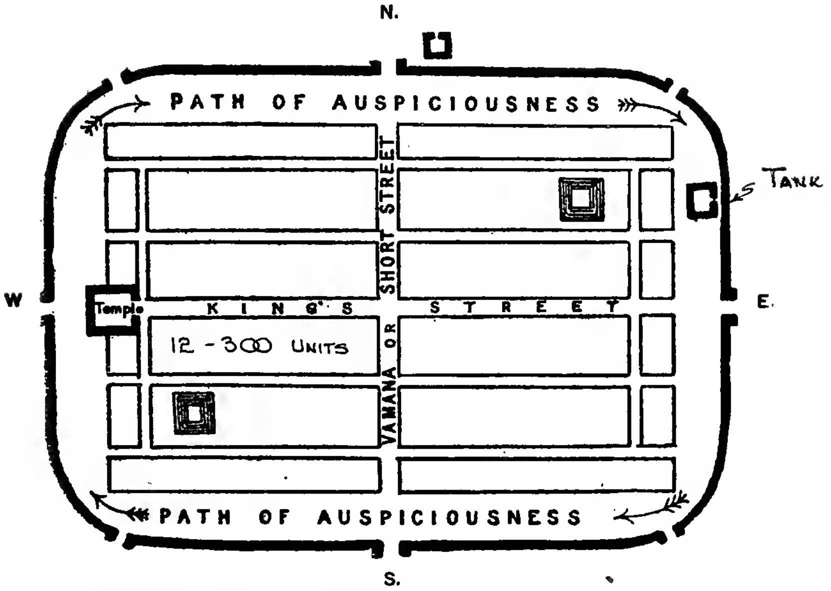
"In this ancient Aryan village custom one can trace the root of the idea of the Bodhi tree, or Tree of Knowledge; for the tree of the village elders must have been associated with the wisdom of sages long before the forest tree became the place of meditation for the yogi who sought spiritual enlightenment. A symbolic or mystic meaning also attached itself to the Council Tree; for, planted at the centre of the cosmic cross, it was the tree of Vishnu—the sun at noon and the all-pervading cosmic force. It stood for the mystic tree of which the sun and moon and stars were fruits and the blue vault of heaven the foliage.

"In a small village the Council Tree, or Tree of Justice, would give sufficient shelter for the general meeting of the house-holders, who formed the Parliament of the Indo-Aryan village. They had the power of nominating all the ministers, the Council of Five, except the headman, whose office was hereditary, but who could be deposed by the Raja, the head of the clan, in case of any grievous offence against the laws of the Aryan community. In the larger villages and towns the meeting-place of this general assembly would be in the parks or groves of sacred trees planted near the gates.

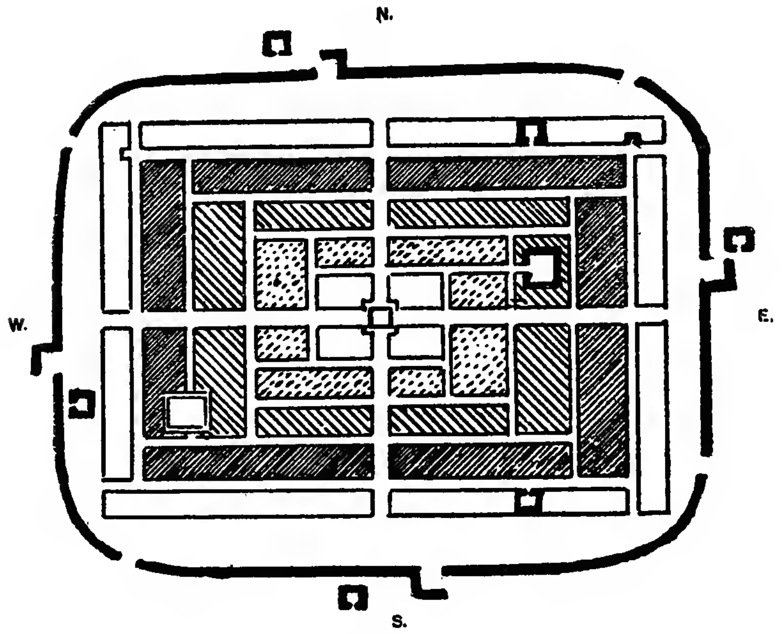
"The Mânasâra gives the maximum width of the main village streets as 5 *dandas*. The others varied in width from 1 to 5 *dandas*. The size of a single cottage was reckoned as from 24 feet by 16 feet to 40 feet by 32 feet. They were generally grouped together by fours so as to form an inner square or quadrangle; the "magic" of the square depending on the fact that it afforded the best protection for the cattle of the joint household when they were driven in from the pastures every evening.

"Four cottages were combined into a single habitation with its own inner courtyard, and this was the next step in the evolution of the Indian house-plan. Such a house might belong to the chief herdsman, who was an important personage in the Aryan village communities, or to the headman of the village, both of which positions were hereditary. This was the derivation of a house-plan, eminently practical and suitable for a tropical climate, which is still universal in India for all classes, from the well-to-do ryot to the Maharaja, except where Indians prefer to make their surroundings uncomfortable and insanitary by adopting building fashions appropriate only for European climates and social conditions."

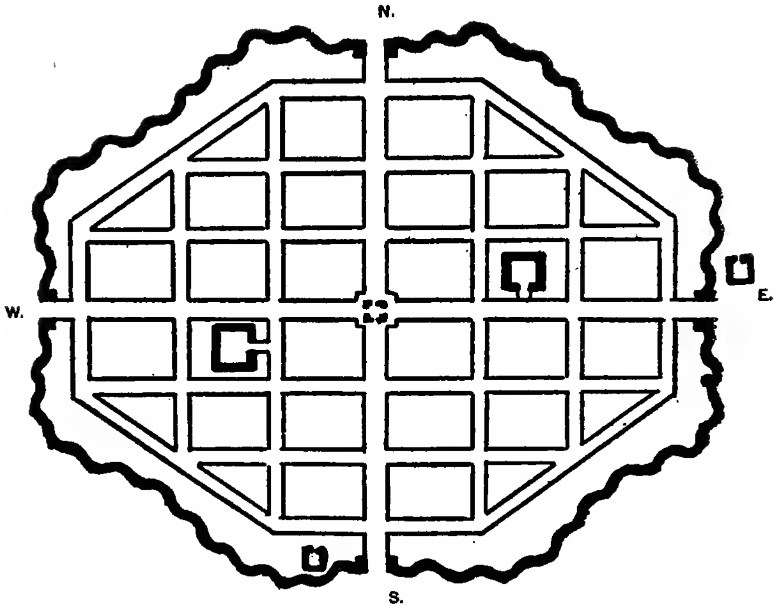
"Just as the village cottage, or village hut, formed the unit of house-planning, so the village plan was the unit used to form the mahalla, or ward, in town planning. The Mânasâra recognises forty different classes of villages and towns, according to the extent of the lands owned by them, commencing with a village-unit which was 500 *dandas*, or 4,000 feet square, so that the extent of the largest cities would be 20,000 *dandas*, or about 30 English miles square. Of this area about one-third was devoted



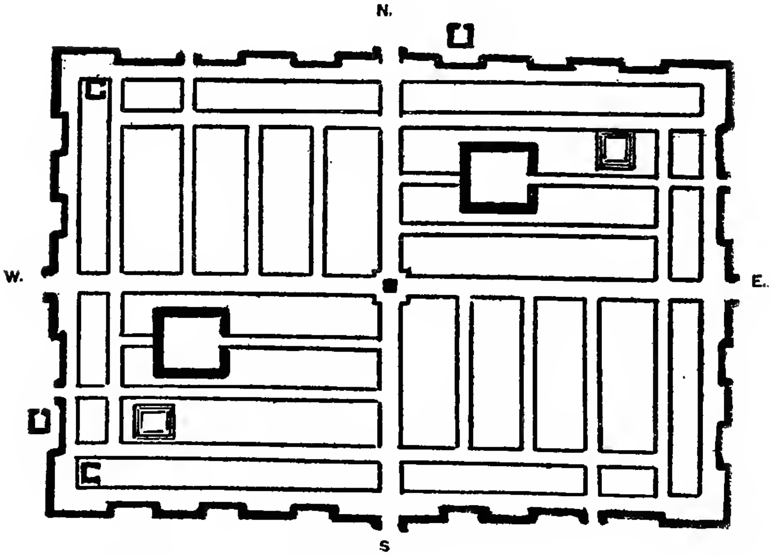
DANDAKA (E. B. Havell) 52



NANDYAVARTA (E. B. Havell) 53



PADMAKA (E. B. Havell) 54



SWASTIKA (E. B. Havell) 55

to building space, and the rest of the agricultural lands owned by the community. It should be observed that neither a village nor a town was usually square in plan, but a rectangle, with the long sides running east and west, so as to secure a proper circulation of air even in the largest cities. In the description of Ayodhya given in the Ramayana, the proportion between its breadth and length is as one is to four. Pataliputra was about 9 miles in length and 1½ miles in breadth. Hindu Gaur was also a long rectangle. One of the long sides generally faced a lake or river, an arrangement which provided bathing facilities for all the inhabitants, and obviated the necessity of building defensive works all round."

It will be interesting to examine in detail some four of the village plans, of which eight standard types are given in the Mânasâra. (These also are from Mr. E. B. Havell's book "Ancient and mediæval Architecture of India.")

"The simplest one (52), called Dandâka, after the staff carried by Sannyasins, was specially intended for a hermitage (asram) or other religious community. It consisted of from one to five long parallel streets running east and west, with three shorter ones intersecting them in the middle and at the two ends. There were two bathing tanks near the N.E. and S.W. angles of the village, and various shrines appropriate for the particular sect to which the villagers belonged—the principal one being placed at the west end of the Rajapatha, with its entrance facing the rising sun, minor deities had their temples on the outskirts of the village, outside or inside the wall or fence, which had four large gates facing the two main streets, the smaller ones at the angle of the village. It contained from twelve to over three hundred houses."

"In the plan termed Nandyâvarta (53), each of the eight inside blocks had two rows of houses; the narrower outside blocks only one. The arrangement of the different social grades is shown by the relative depth of shading in the plan; the highest class in the centre of the village, occupying the four blocks which are left unshaded."

"The outer blocks of houses, to which Ram Raz makes no reference, were probably the bazars placed near the gates of the town or village, both for convenience and for the purpose of collecting tolls. In the Umagga Jataka there are frequent references to the four bazars placed at the north, south, east, and west, and serving their respective quarters in the King's city. The two main streets, as always, formed the cosmic cross. In the centre of the village, at the meeting of the cross ways, was, says the Mânasâra, the auspicious place for the assembly-hall, or for a temple of Brahma, which had four entrances."

"The plan called Padmaka (54), after the lotus leaf, is interesting as showing how sedulously Indian town-planners avoided the inauspicious lay-out in which the main streets run upon diagonal lines in the direction of the intermediate points of the compass, the objections to which are not merely sentimental. A plan with streets radiating in all directions from the centre of the village, like the spokes of a wheel, would be the first to suggest itself to an Indian designer, on account of its symbolism. He avoided it for very practical reasons. First, that it was bad for purposes of defence, as it gave an enemy many opportunities of establishing himself in the centre of the village by a sudden raid. Secondly, that it tended to the congestion of the traffic, and an uncomfortable plan of house and garden, especially in the middle of the village. Thirdly, that the streets would mostly run in the wrong direction for the sun."

"Another interesting village plan (55) was based on the Swastika, the mystic sign derived from the "magic square," which, as stated above, represented the four quarters of the world and of the universe. The magic of the Swastika lay in the fact that in the Aryan camp it was a formation used for defending the four gateways; it was also the Indo-Aryan religious compass, indicating the apparent movement of the sun

across the heavens, which movement still forms part of Hindu religious ritual in the performance of pradhakshina, or the circumambulation of the shrine, keeping the right side towards it. Philosophically the sign represents the principal of evolution; the reverse sign, associated with black magic and representing involution, was adopted by certain schools of Hindu Philosophy. In this plan the direction of the house blocks in each quarter of the village indicated the movement from left to right."

That these forms of plan were intended as types, rather than as examples to be slavishly followed, will be realised on reading the following quotation from the description of Madura in Mr. Venkatarama Ayyer's work "Town Planning in Ancient Dekkan."

"The mathematic accuracy which one might have in a sketch was never sought to be translated in practice in the construction of the walls of this ancient city. The starting point and circumscribing walls having been decided upon, it then became necessary to allot the several classes of the population to definitely marked areas and provide ample open space, public baths, public halls, schools, markets, gymnasia, or public playground, and other appurtenances of the city. The portion for the palace having been duly apportioned, the remaining space was utilised for schools, streets, playgrounds, and separate quarters for the different classes. And all this was done according to the Sastras, due importance being attached to the provision of groves and parks which were reared afresh in several parts of the newly planned city."

"The temple was thus situated just in the centre of the city and shed a halo of sanctity all around. Nor were the streets cut out with mathematical exactness of shape. There were not only big broad straight streets but also crooked streets and small lanes in the new plan. The broad streets were as wide as a river and the houses on either side rose like tall trees on the banks of the river. The comparison of the broad streets to the bed of a river and of the houses on either side to tall trees growing on the banks of the river are suggestive of the natural gradient in the streets admitting of a thorough washing down in rain or in flood, and the practice of building houses in towns on elevated ground."

"The markets were two, a day market where business was transacted during day time generally; and a night market which was open throughout the night. Though these two markets were very near each other they were yet separate, two big streets having been specially allotted for the purpose."

"Small traders and weavers exhibited their wares in the other streets of the city and round the King's palace as well. The streets round the palace where the King's ministers, advisers, and servants lived, were broad enough to admit weavers to stand by and sell their goods. Petty traders were permitted to exhibit the different cloths by the road side. They spread those cloths on the streets and did business."

Now the European with guiding factors much less complex than these was thrown much more on his own resources, and for this reason perhaps his cities, defective though they may be in some respects, are based more closely on obviously logical needs—such as those, originally of defence, and subsequently of commerce and of industrial facilities.

Then again, there seems to be a much larger proportion of European cities built on irregular and undulating sites. That, of course, was due to the choice of defensive positions for the camps of the fighting tribes, generally hill tops. It was only a highly organised civilisation like that of Rome, or of India at certain times, that was able to arrange that the fort was not necessarily a hill defended by natural advantages. It does not often appear to have occurred to the European to base his city so definitely on a set of regular rules. You will find many European cities with two good cross streets and generally with a Council house at the meeting place of these two cross

streets. There is a very marked similarity between these plans of Indian cities and some of those old European cities, though these similarities cease as soon as organisation becomes more complex.

Then there are other factors. It may be pointed out that mediæval cities were more or less based on the old trade routes where they met at an important centre, and as these routes took the easiest line across the country, they contributed to certain irregularity in the city. Also the surface of the earth in Europe is much more generally hilly than you find it in most districts of India. It must strike every European coming out to India to find such a very large proportion of the surface of the earth practically flat, whereas it is not nearly so much so in Europe. There, if it is not mountainous—and geography shows what portion of it is really so—a very large proportion of the country consists of rolling undulations, with valleys and hills, and only a comparatively small portion that is as flat as the great plains to be seen all over India. Here the first impression that one gets is that the land is sea and the hills form islands standing out of it; but this effect is not usual in any part of Europe.

So you see that European cities are more or less adapted to these irregularities and therefore are often more irregular in general structure. Then again there is the climatic difference. In Northern Europe the sun is courted rather than feared, and streets securing a longer period of sunshine are preferred to those having less. Thus a street running east and west gets very little sun during the winter owing to the fact that the sun at noon is only some 20° above the horizon, while a street running north and south receives the maximum of direct sunlight. More particularly in residential areas one finds a preference for streets running more or less north and south. This consideration is not applicable to Indian cities, especially those of southern India, where the sun's altitude at noon ranges from 70° to 90° and shade is always acceptable.

In India the desirable aspect for houses is not governed by the sun but by the direction of the winds, especially of those which, coming off the sea, or for other reasons, are relatively cool and refreshing. Where the juxtaposition of houses cannot be avoided it will usually be best to align the streets in the direction of the favourable breeze, but in the case of detached houses the road might be at right angles to this, so that the wind blows between the houses and sweeps through them from front to back or vice versa.

One would not suggest for a moment that the useful suggestions of your own teachers should be disregarded, but there is the necessity of appreciating the points in which they are applicable to present conditions and of interpreting them broadly in the light of modern practice, so that developments in the future are not hampered by misunderstanding of the true intention of the old teachings and of the merits that it was their aim to secure.

We may assume that they were to a large extent put forward as an easily understood way for securing certain definite advantages. You will often find that if you employ the same method of typifying and formulating the advantages that you want to gain in your new developments, it affords an easy method of determining them. There is, I think, a certain amount of parallelism between India in the present day and mediæval Europe. We had in mediæval times, in Europe, symbolisms which took the same place, in regard to buildings, as your old Sastras do, not only in regard to buildings, but also in regard to town planning. In Europe these do not appear to have extended to town planning, but as they certainly show very prominently in the design of our mediæval buildings, it would be a most useful course to study the social conditions of Europe in the middle ages, to understand the parallelism between these and existing ideals in India, because it would enable us to forecast, to some extent, the course that the present developments may possibly take in the future.

Now the smaller Indian towns of the present day still maintain to some extent the organisations of the past, and illustrate both their merits and failures. In most cases a reasonably good site has been chosen with sufficient fall to carry off storm water and a supply of good water from wells or a clean tank on the higher part of the site. With a climate normally dry it was only necessary to obey the dictates of cleanliness to ensure healthy living. Where there existed a good irrigation tank this was often retained for the purpose of water supply, usually deepened and embanked to ensure cleanliness, while other tanks at lower levels provided accommodation for washing and bathing. As the supply areas of these tanks were gradually occupied, if they were not to be abandoned it was found necessary to supply them from other tanks at a higher level, and thus a tank system developed and answered its purpose until neglect allowed the water to become foul and useless.

If the site were on the banks of a good river of course the problem of the water supply was simplified, but here, as soon as a town grows to any size, it becomes impossible to avoid pollution and the river ceases to be an admissible source of supply.

There is every excuse for reference to this question of water, in that it has been a fundamental one in the organisation of the Indian city. The habits of the people demanded a copious supply of water, while it was rare that costly engineering works could be undertaken to bring water from afar. With better facilities in this respect, more latitude in the city structure is admissible, but it must not be forgotten that a tank system is also a provision for surface drainage during heavy rains, and as the town area no longer needs irrigation the tanks and their connections are still needed in order to conduct the water to the lower margin of the town where it can be utilised for agricultural purposes.

Apart from their value for washing purposes and equalising the temperature, tanks act as a safety valve in cases of sudden storms and relieve the pressure on the connecting channels. (See also Chapter X.)

Thus an Indian city properly organised will always retain its tanks, and their abolition, though occasionally justifiable, is more often the result of lack of consideration and is distinctly prejudicial. So far our argument has been based solely on practical considerations, but we should on no account omit the support it receives from those of beauty. Everywhere water, either as stream, river, lake or tank, is a source of delight and particularly is this the case in a hot climate. It hardly needs the illustrations given (56, 57, 58, and 59) to indicate the beauties of such adjuncts to the city scheme.

It is worth while to say something in regard to influence of European methods on Indian cities. So far it has not been very good, although in the future we may hope that it is going to be very much better. But the two cities most influenced by the European commercial and industrial methods are, as we know, Calcutta and Bombay. Both these cities are examples of very unhealthy and unsatisfactory modes of housing, examples of what to avoid. Madras has, so far, escaped the dangers that beset Calcutta and Bombay; and it will do well to hold firmly to its traditions in order that it may escape for good these unfortunate developments. We are beginning to see—and are doing a great deal to mitigate—the defects of these methods. Of course harm was done in England a century ago, and in other parts of Europe, in Bombay and Calcutta within the last half century. Madras has not fallen into the trap up till now, and has not embarked on the construction of high buildings, which result in the worst state of congestion. The utmost congestion that exists in this Presidency is nothing as compared with that to be found in parts of Calcutta and Bombay. Therefore by holding out for small houses, as against big blocks, Madras will be able to stave off the defects that have appeared in these two cities.

UJJAIN. THE RIVER SIPRA 56

JUBBALPORE. HANUMAN-TAL TANK 57

TIRUVANAMALAI. MOSQUE AND TANK 58

COCHIN. WATERSIDE 59

The defects of overbuilding are now so generally recognised that no more than this passing reference to them is needed. The main point for our consideration is that the more recent views on town development which have initiated the Garden City and the Garden Suburb are closely akin to the obvious needs of India.

The Indian garden city already exists; examples may be found all along the west coast from Mangalore to Quilon, and while these are the product of special conditions, we need not be precluded from adopting similar methods in many other places. Here and there they may not be practicable, as for example where the land has a high agricultural value, and where the town's existence depends to a large extent on adjacent cultivation, but this is the less usual condition of things, and elsewhere the advantages of giving garden ground to each house would be undoubted, were the householder prepared to cultivate his garden. This for the moment is the main difficulty, but there are many signs that those, hitherto unused to this, are being attracted by the advantage of possessing, and cultivating, a small garden, and that both health and pocket are the better for it. As this view becomes more general the problem of the Indian city and its tendency towards congestion will become less acute, and side by side with the European, the Indian citizen will progress towards a better standard of civic life.

Chapter X.

PROBLEMS IN INDIA.

The preceding chapter dealt in a general way with the main differences in the origin and development of the European and the Indian city.

We may follow this up with a brief study of the special factors dictating the character of the Indian city at the present time.

It is sometimes well for one to come from a distance in order to see more vividly what such factors and characteristics are. Those who have spent all their lives in Indian towns, and know them far more intimately than a European can ever hope to do, are nevertheless at this disadvantage, namely, that all these details are taken as a matter of course, that they seem inevitable, as a part of life and surroundings, and it is consequently more difficult for the resident than for the outsider to realise how far they are at variance with the march of events and what steps may be necessary to reconcile conflicting demands.

In India it appears that many, face to face with new conditions, are less hopeful than they need be of bringing these into harmony with the recognised ones, and more prone to say that the new must sweep away and replace the old; many seem prepared to sacrifice the merits together with the demerits of the old, and to accept the demerits, together with the merits, of new conditionings.

Now a more optimistic view than this may be offered, for assuredly we may accept the advantages of progress and yet retain the best of existing systems. The evolutionist is building on a firmer basis than the revolutionist and the rational method of solving the problems of India is essentially an evolutionary one, retaining much that has kept the national life sound and sane during centuries of political disturbance, and refusing to allow new developments to break up this system without the substitution of one equally beneficial in its place.

Though this generation, happily, was born too late to see the worst results of unrestricted industrialism, the after effects of this nevertheless remain sufficiently conspicuous as to make us extremely dubious as to its advantages and extremely desirous of seeing every possible precaution adopted when we find mechanical methods of production taking the place of the individual craftsman. The question may be asked—What this has to do with Town-Planning ? A little consideration will show that it has a great deal to do with Town-Planning. When dealing with the economic aspect of the question it was pointed out that economic conclusions must always be subject to review in the light of other considerations; probably the most important of these other considerations is the development of the citizen as an individual.

Someone said of the practice of Art, " It is not a trade to be followed, it is a life to be lived," and this is applicable to some extent to every occupation. Without a doubt the more anyone is able to take an interest in the craft by which he earns his bread, the more efficiently and vitally will his faculties be expanded. This is one great weakness in the organisation of industry—it takes captive the less capable, narrows and cramps the faculties, and while it offers material advantages, saps initiative and mental vitality. Those countries that are most under the domination of industrial organisations on a large scale pay a heavy toll in deteriorated masses of people, ever on the verge of being unfit for their own or any other employment, and it may well be asked if the increased output of material and the resulting luxury compensates for this state of affairs. When

the standard of living all round is thus raised, from a material point of view there is doubtless a gain; but it is at the sacrifice of other things that are better worth having.

When the Indian worker allows himself to be exploited on these lines he fares no better, indeed somewhat worse, than the European, and one need only contrast the conditions of life of the weaver of southern India with those of the mill hand of Bombay to get a hint as to what the difference means. Probably the latter earns more money than the former, but in what other respect is his life comparable; working in a monotonous fashion in a noisy factory and living in a crowded and insanitary tenement as against carrying out work to his own taste in his own home, which may quite well be a decent house in a quiet but sociable neighbourhood. It is the same with other crafts. If the workers were far-sighted enough they would make such terms with commercial enterprise as would compensate them in time and comfort for the hardships of forming part of an industrial machine. This they do not at present; a few additional pice per day tempts them to forget that they are losing what is worth far more, and transforming themselves from individuals with views and tastes of their own into mere replicas of a characterless type.

Our generation has not seen the worst—thank God that it is over—of the results of industries carried on in this manner without the provision of carefully considered antidotes such as we are now gradually discovering. It would be better to do without commercial enterprise at all than to pay for it on the terms that have worked so much mischief in the past.

So far the Indian city has to a large extent escaped these dangerous tendencies and its system of hereditary trades increases its power of resistance. It may be argued that this is uneconomic, and on a purely monetary basis it may be, but wealth and poverty are terms that can only be used relatively.

The princes in some ages of the world lived in far less comfort than many an artisan does to-day. We know that these princes thought they were living in the utmost luxury according to that stage of the world's development, but now every European artisan thinks himself very badly off if he does not secure more than the mediæval noble as the wages of his daily toil. Thus we see that wealth and poverty are, from the psychological standpoint, absolutely relative, and one's poverty is measured by what other people spend. On this basis it may be claimed that there is less poverty in the average Indian city than in a European one. ?

No encouragement should be offered to measures tending to break up the Indian social system; it has been of value in the past and may be of no less value in the future. If it be admitted that it presses hardly here and there, as to a European it must sometimes appear to do, there are assuredly devices for amelioration without demanding any revolutionary course.

The traditional diversions of the people and their prescriptive occupations are of service, in helping them to resist the temptation that wholesale exploitation—not using the word exploitation in any bad sense, but merely as meaning the development of the resources of the country to produce things in the most strictly economic fashion—holds out, and may keep this at bay until the conditions of organised output become far better than they are at persent. Such exploitation would be very unfortunate in its effect on the worker, unless he is stronger than the usual type of working man. Things have already improved in Europe; they have become better during the last 20 or 30 years, and one may hope to see them better still. The chance for India is that it has recognised the danger before these methods have become as general as in Europe. They are bound to come into operation, and if they make headway only after the counter-balancing measures are recognised, India will be happier than if the needful antidotes have to be applied subsequently.

Division of labour may take account of the established social system and be all the better for it. If the social organisation be bartered away for what may look like an economic gain such a bargain will in the end prove to be a very bad one.

The Indian is less qualified to resist adverse influences than the European who has had to fight for his position till such fighting has become a habit, and the class termed "unemployable" would much more quickly arise, therefore it is wise to keep to a system that acts as a check on such an undesirable development. People have suggested that the system of caste is a system of superiorities and privileges. It is not necessarily anything of the kind, though there are many who regard it in that light. There will, however, be found in every community those who look upon it as a system not of privileges, but of duties and responsibilities. Every caste has its own responsibility, and the higher the caste the greater are its responsibilities towards holding up a standard. Then the trade castes seem to have many admirable possibilities. Take for instance mediæval times in Europe, when the trade guilds were really the backbone of the mediæval cities; each trade had a definite guild to which only those duly qualified were admitted, with their meetings and their board governors, who regulated the affairs of that particular trade. These had a share in the government of the city and were of immense service in making the mediæval city the great scene of artistic activity that it became. These guilds were very much in evidence and were of the highest value in maintaining the standard of life and the standard of capacity in the cities as a whole. Therefore one asks—May we not look for something like this in the various crafts which have their hereditary exponents in India?—If these were to work gradually in the direction of mediæval trade guilds, they might be a tremendous factor in enhancing the interest of the cities and civic life.

These views do not preclude us from looking forward to a general uplift among all classes of community both materially and psychologically. The Brahmin can devote more attention to his function as a guide pointing the way to right living and can make the Agraharam, even more than it is at present, an example of how a group of healthy and cleanly homes should look. The other castes can in the ways that most appeal to them find means to enhance their special communal areas, and even the paracheries need not be squalid. We must all have seen efforts in every section of the community to reach an improved standard of living and may be confident that with encouragement these efforts would achieve undreamed of results. It should not be difficult to devise the form of encouragement best suited to the circumstance of the case. Some remarks of Professor Geddes in connection with the city of Baroda may be quoted here.

"It is a superstition of that lowest form of Western Mythology which disguises itself as 'Political Economy,' 'Utilitarian Philosophy,' &c., to assume that men only work for money wages. The war is giving millions of vivid individual proofs of how far more intensely and adventurously they will exert themselves for social motives; how much more deep than money is the appeal of honour, how much valued also its costless awards. Let peaceful life then learn from war. Let activities be stirred and evoked by the call to citizenship, and rewarded by its simple yet genuine honours, and by the approval of superiors as well as fellow-citizens. May we ask then for the improving poles as civic units, for their houses and householders and younger members as again units of these, and for the various municipal services and servants also, some recognition such as they would value? Why not even some annual award, say from a flag to a fountain for the best kept pole, of a banner or a garland for the best kept house, the most pleasing garden, thus giving household and gardener their meed of praise. So far the various municipal services, and at all their ranks and level. No skilled physician and bacteriologist but knows that the humble sweeper is also a

companion of that order of Pasteur and Lister to which it is his highest professional pride to belong."

Even if there are doubts whether the award of a garland or a flag or a fountain—why should it not ?—would encourage people to beautify their houses and gardens, there is a more definite pecuniary award which is sometimes offered in Europe. In some of the continental towns (one regrets the claim cannot be made that the idea has yet been adopted in England) an award is given to a townsman who builds the best house in the year, the one which is regarded as having the most beautiful frontage in the street, an award in the shape of an exemption from taxation for one or two years. This seems an excellent practice, as showing that the municipalities have a very definite interest in encouraging the beauty of their streets.

These are merely suggestions, and perhaps other methods may prove more advantageous ; at any rate something in this direction could well be done.

We will pass on to a problem less exciting perhaps, but one that cannot be disregarded, namely, that of sanitation in the usual, perhaps somewhat narrow, acceptation of the term.

A detailed discussion of drainage is beyond the scope of these studies, but there are certain features of the question as it stands at present that cannot be overlooked. India had in the past a definite sanitary system, perhaps ideally perfect for small communities, and provided it was rigidly adhered to. Now neither of these conditions have been maintained. Even the large city of old days was more or less a series of groups with gardens and open spaces in between, quite unlike the closely-packed towns of later centuries. Again, the discipline of strict observances has become relaxed with the result that it is impossible to restore the old conditions in the larger cities of to-day.

There seem to be two alternatives. Where the city is definitely and irrevocably compacted together, there can be no other course than the adoption of European methods with such adaptations as can be made to meet national habits, and when all that is practicable has been done in this direction, to train the people to fall in line with the demands this system makes. At the same time we should do everything possible to avoid building developments that necessitate the extension of sewerage systems, so that for as long as practicable there may be the alternative of the more traditional practices. The open lay-out of the garden suburb is of use in this respect, and if we can revive the old idea of the city as a group of villages it will help us. We cannot afford to introduce everywhere the costly systems demanded in Europe, neither will they benefit us unless the inhabitants are prepared to accept the change.

At the moment one cannot have any particular enthusiasm for this solution, as without a more definite general appreciation of the demands of good sanitation it is very difficult to ensure its working smoothly.

The second alternative is more on the lines of existing practice, and with this systematised and organised drainage may be classified under three heads—surface water, sullage, and soil. Everywhere there must be some definite courses through which rain water can be carried off roads and footways, and as the volume of storm water fluctuates greatly these water courses should be independent of all other drainage.

When there is a sewerage system we often see a very inadequate handling of surface drainage. Can we not imagine a system of dry weather roads, roads that will take off the rain water, perhaps at some slight inconvenience to the people, while the heavy rainfall is on, but naturally only for a small proportion of the time, the period that the road is a water course. Such roads exist at the present moment and there is much room for their development as against narrow channels. We must see that they are not abandoned. It is more often a case of abandonment than of construction.

For sullage or domestic waste water it is usually preferable to provide a channel

system where the house compounds are too small to enable the sullage to be used for cultivation and thus absorbed by plants. Cesspools in any form are to be avoided as objectionable.

The removal of excreta demands various expedients according to the habits of various classes of the community. Better class dwellings should be provided with receptacles which can be exchanged on collection, and carried to suitable depositing grounds or places for septic treatment. Public latrines if permanent should be similarly furnished, but it may be doubted whether the more primitive form of latrine should not be a movable structure, provided with screens only, frequently shifted and the site dug over.

The provision of liberal space with some degree of privacy is a good expedient from the sanitary point of view and often far safer than elaborate sewerage schemes.

In connection with this it is worth mentioning that a very eminent sanitarian, Dr. Vivian Poore, thought that house and garden might be a self-contained sanitary system, and he did by experiments prove that a house with a garden of about half-an acre could deal with its own refuse of all kinds and that a perfectly sanitary arrangement could be made without any drains going outside the limits of the garden itself, so that you see there are possibilities in this direction.

Another feature in the life of the Indian community is the strong feeling of unity in the family, the dislike of dispersing and the affection for the family home. Again the traditions of trade and occupation support this tendency to a large extent. We have already noticed the effects of this and need not recapitulate beyond reminding ourselves of the need to make such provision as best meets the requirements of this characteristic national trait both in improvement schemes and in extensions outside the present urban area. We have also considered the methods adopted in regard to the storage of goods. Of course, this idea of personal control of godowns and stores and the necessity of transporting goods again and again from one store to another is a serious handicap on the commercial prosperity of certain towns in India.

There seems to be an undue fear in this country of theft and burglary. We may take it that theft and burglary do exist, but would it not be cheaper to have an Insurance Company against burglary and thus secure freedom from the personal supervision of godowns, and the extravagant methods of business that this entails.

To pass on to another question, we know how much European cities have suffered from ill-considered railway developments, and to a certain degree it may be affirmed that India has suffered still more.

The necessity for economy in construction, particularly with regard to the amount of plant employed, has discouraged grading on the principle of "cut and fill" in favour of keeping close to the natural level; which course is also favoured by the large proportion of flat country.

In consequence of this the use of over or under bridges instead of level crossings is exceptional, and much inconvenience is caused by these level crossings in town areas. Again, the earth for the low embankments required to clear drainage and irrigation channels is not brought from cuttings, but is dug from shallow pits termed "borrow pits" alongside the line, pits which collect the water, then gradually dry out and being without drainage form suitable breeding places for the mosquito and consequently encourage malaria.

The excuse for the procedure is, of course, economy, but it would not have involved a great increase in cost to have formed these excavations as drainage channels so that the water could flow away instead of evaporating. In some cases such channels might have been of use for irrigation, in others a good tank could have been formed at a slight increase of labour, avoiding the danger from malaria that these "borrow pits" are responsible for.

The level crossings referred to have become so great a nuisance in the larger cities that it has been found necessary to build costly overbridges which involve an expenditure much greater than if the road and rail levels had been considered and adjusted from the start, but despite these experiences, railway engineers do not yet generally realise that in proximity to large and busy towns level crossings ought not to be attempted. In 1915 a new line was proposed in the northern part of Madras city involving such crossings to some 14 important streets.

The economic handling of heavy goods is yet another matter which demands investigation. The cheapness of labour has led to the impression that there is but small demand for mechanical methods of transfer, but in view of the rapid development of commercial facilities it is doubtful if this condition of affairs will continue and it is probable that in the near future superior facilities for loading and unloading goods will be extensively required.

It may further be noticed that the advantages of water carriage have not been by any means adequately exploited in Indian towns. In many, where the situation lends itself admirably to the provision of a canal system, such a system is lacking—and even where canals have been made they are often neglected and not made the best use of as a means of transport. It may be contended that important existing canals in some cases fail to pay for their upkeep, but it must be remembered that a canal is of little value without a systematic linking up with factory, storage, and port areas. Ports like Calcutta and Cochin, placed on low-lying ground, would be greatly the better for an extended canal system such as we may find in the Netherlands, and there are numerous other coast towns where development on the same lines would be economically sound.

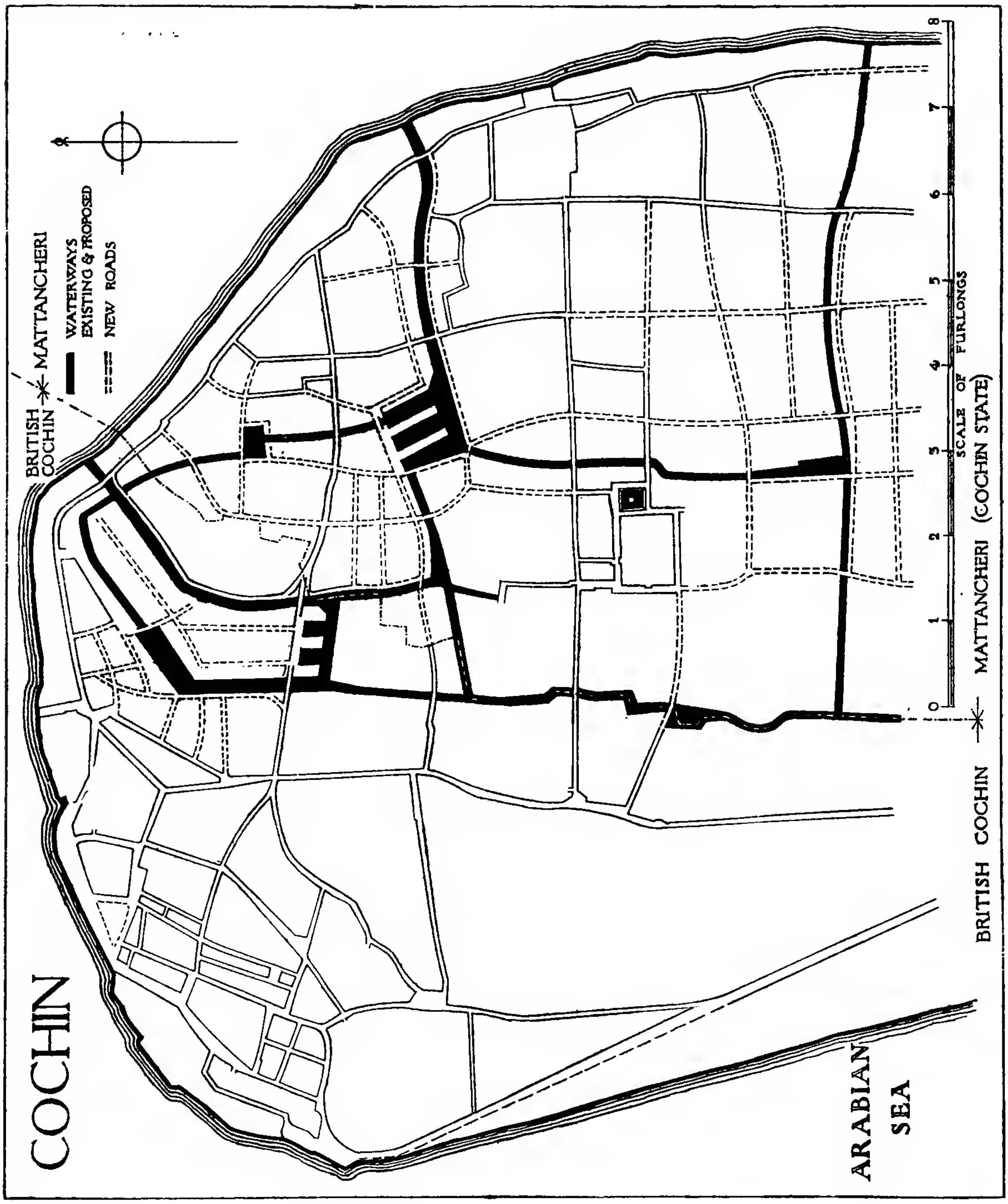
The accompanying plan of Cochin (illustration 60) gives a sketch for the improvement of the now neglected tidal canals in this city, while the plan for Madras (see M. VIII) shows some possible developments of the waterways there. (See also Chap. VIII.)

The consideration of Indian problems would be incomplete without a brief reference to the epidemics of plague that so seriously affect the welfare and prosperity of many Indian towns and villages. The measures necessary to combat these are now so generally understood that it is only necessary to recapitulate them, without going into the pathological aspect of the case. In short the carrier of the plague germ has been proved to be the rat flea, and measures discouraging harbourage for rats diminish plague.

Building in soft material such as earth, buildings closely packed, and unprotected grain and other stores are to be abandoned as far as possible. Earth or mud building where unavoidable on economic grounds should have stone or brick foundations and wire netting protection carried through the base of the walls. Still more important is it that houses should be isolated from each other or only permitted in small groups. The plague camps have proved the advantages of isolation and have done much to encourage building in India on a more open system than was formerly customary; the relative immunity of detached houses has given great encouragement to development on lines akin to those of the garden suburb in Europe, and it only remains to organise that the extension of affected places be carried out on these lines to produce a very great amelioration in the effects of this disastrous epidemic.

The provision of well constructed and suitably placed buildings for the storage of grain and other goods is also of service, and here both economic and hygienic requirements coincide in demanding this course.

To put it broadly, all buildings closely packed should be of hard material and well constructed, while kutcha buildings must be more or less isolated with good open space between each block. This may appear to involve very drastic procedure, but when the annual loss in life and well being is taken into consideration, it will be realised that if we keep these aims in view in our improvement schemes, we may reasonably expect to get control over this terrible scourge.


COCHIN
BRITISH COCHIN
MATTANCHERI
WATERWAYS EXISTING & PROPOSED
NEW ROADS
SCALE OF FURLONGS
0 1 2 3 4 5 6 7 8
BRITISH COCHIN
MATTANCHERI (COCHIN STATE)
ARABIAN SEA

60

Chapter XI.

THE USES OF THE TOWN PLANNING ACT.

It may not have been generally realised that Indian authorities have been putting into practice, in an informal way perhaps but none the less in an effective one, the methods which is the object of Town-Planning Acts to facilitate. Now the Madras Town-Planning Act has not yet passed into law, but in many ways you are going busily on and securing all the advantages of its modes of procedure in a manner that those at home could not dream of.

Proportionally to other expenditure you purchase more land than most European cities are able to do, and secure it on better terms, the idea of speculative building values being less exaggerated here than it is in Europe, while in America speculation of this kind is even more accentuated.

Now in connection with town extension there is another point to be looked into. The close relationship between the city and agriculture here, though it has its disadvantages also, sometimes defines building areas in a beneficial way.

We know that we are often very much hampered by the all-pervading paddy lands, cultivated ground of high value and quality, but these sometimes give the city a certain definite line of expansion and prevent the wholesale slashing up of land here, there, and everywhere. Then again, the regulation and guidance of private enterprise in laying out building areas, secured with difficulty in Europe by the aid of Town-Planning Acts, seem to be largely accepted here without any Act at all. For obvious reasons, such as joint ownerships, subdivision of land, recognition of authority and perhaps others, the initiative of the municipality in preparing a general scheme seems to be welcomed instead of resisted as would often be the case among western nations.

One has seen enough of the work being carried on to be able to say that in many cases if a general plan is prepared, the people will adopt this plan. That would not be at all an easy thing to manage among the western peoples. They are very apt to think that the municipality must have something to gain and they must have something to lose. The municipality may have something to gain, but it does not follow that the private owner is going to lose. Still he is suspicious all the same. Now the private owner in India regards municipal enterprise in this direction more favourably, as he would often find it very difficult to make a move without it.

With us the Town-Planning Act has been of quite as much service in reinforcing the Town-Planning movement as an educative measure as it has from the point of view of practical work. Of course it takes some time to get through the preliminary stages in a country where conditions are so complex as they are in England.

Here the conditions are much simpler, the present methods lead up to town planning under an Act for the purpose much more directly and it appears that in all respects save one, India is actually better prepared for the Town-Planning Act than we are in England. The one exception is, however, a most important one; it consists in the too frequent absence of anything resembling an adequate survey. Now we are not speaking of that broad civic survey which has been dwelt on at some length in chapters III and IV, but of the actual normal survey that sets out simply the geometry, as one may term it, of areas, levels, and ownerships. Again and again it will be found that work is held up for lack of this, and it will devolve on municipalities to take such steps as will enable them to secure such a survey at the earliest possible moment.

With regard to the statistical and topographical information and the methods by which this can be presented, a fairly clear idea of what is desirable has already been given, and it is only needful to add a few words of reminder to the effect that when this information has been graphically presented in the manner already outlined, it should not be forgotten that it is there for a definite purpose, that if duly studied it provides a test for the relative merits of various schemes. Though we may, driven by urgent necessity, prepare minor or partial schemes without such information, we shall never be able to deal adequately and continuously with the demands of the city as a whole unless this type of general review is prepared and kept up to date from time to time.

In describing this civic survey one has to generalise somewhat, and this may give an impression that it is mechanical and rigid in its methods. This is not the intention; it should endeavour to take account of all local sentiments and peculiarities in order that any scheme based on it shall in a like manner be in harmony with the natural feelings peculiar to, and varying with, every locality.

In this connection a few words from Mr. Thomas Adams' Presidential Address to the Town-Planning Institute may be quoted.

" In one sense the Act was a goal in itself, but in a wider sense it was the beginning of a new method of applying scientific principles to the problems of a city development and social amelioration. However substantial a claim may be made as to the beneficial effects of past control of sanitation and land development, we have already reason to believe that the movement initiated with the Act of 1909—that is the latest English Act—will be a much greater factor for good in the same direction. It gives us the opportunity of using skilled knowledge to get down to root causes and of exercising discrimination and intelligent foresight with regard to problems which hitherto have been dealt with in an unscientific manner.

"In Town-Planning schemes we are seeking to lay the foundations of still healthier living conditions in our cities than has been possible in the past. That is the point that requires emphasis now, at a time when we see more than ever the importance of physical fitness and industrial efficiency." He is here referring, as you may imagine, to the war : " We are trying to provide the best possible conditions for the development of the next generation of men and women, and to prevent that unnecessary waste of young life that goes on to-day in our towns as a result of removable causes. (We all know what deplorable loss of infants and young lives there is in some Indian cities.) We are also aiming to conserve industrial and financial resources, and to curtail wasteful municipal expenditure. We are planning for better arterial roads with a view to securing more convenience for industrial transportation, and we are seeking to make housing conditions better, partly because it is only right and just that they should be better, but also because on that depends the maintenance of a high standard of efficiency on the part of the human factor in our industries. Whatever else the war has taught us as a nation, it has brought home to us in a striking way the value of these things."

In these remarks Mr. Adams emphasizes " intelligent foresight " in regard to the problems of the city, and one would most emphatically urge on you that if this movement is to be a success, it should go much farther than preparing plans for bits of land here and there in order to meet urgent and immediate needs, that its aim is the visualisation of the city as a whole, first the city as it is, next its probable requirements, and lastly these two factors combined, and combined with imaginative and sympathetic skill which and which only will give us the city as it ought to be in the future.

Having sketched out in broad outline the operations facilitated by a Town-Planning Act we may fill in a few of the details.

Let us take a few extracts from the Town-Planning Act such as one may expect

to work from. The first point is what a town-planning scheme may be expected to provide for. The typical Act says :—

"A Town-Planning scheme may provide for any of the following matters :—

"(*a*) The construction, diversion, extension, widening or otherwise improving, or the closing of streets, roads, and communications.

"(*b*) The construction, alteration, removal and demolition of buildings, bridges, and other structures.

"(*c*) Water supply.

"(*d*) Lighting.

"(*e*) Drainage, inclusive of sewerage and of surface draining and sewage disposal.

"(*f*) The allotment or reservation of land for streets, roads, squares, religious and charitable buildings, open spaces, gardens, recreation grounds, schools, markets, shops, factories and public purpose of all kinds.

"(*g*) The preservation of objects of archæological or historical interest or natural beauty and of buildings actually used for religious purposes or regarded by the public with special religious veneration.

"(*h*) The imposition of conditions and restrictions in regard to the character, number, architectural features, and height of buildings allowed in specified areas, and the purposes to which buildings or specified areas may or may not be appropriated; and the provision and maintenance of sufficient open space about buildings.

"(*i*) The suspension or modification, so far as necessary for the proper carrying out of the scheme, of any provision relating to buildings in certain Municipal Acts or in any rule, by-law, or regulation made under the said Act and in force in the area included in the scheme." That is to allow you a certain amount of freedom. You are not to be tied by the rules, regulations, and by-laws that you had previously. If you think fit you are entitled to vary them under the special scheme prepared under the Act.

"(*j*) The modification of regular lines of streets prescribed under any Municipal Act.

"(*k*) The laying out of land as building sites.

"(*l*) Such other matters not inconsistent with the objects of this Act as may be prescribed."

Passing on to some other points, first it may be asked what it is necessary to submit. This is the general clause.

"Every draft scheme (that is the early scheme) shall be printed and shall be accompanied by a plan showing the lines of any existing streets and those of the streets proposed in the scheme, and shall contain the following particulars :—

"(*aa*) The ownership of all lands and buildings in the area to which the scheme relates.

"(*bb*) The area of all such lands whether public or private.

"(*cc*) The land allotted or reserved under clause (*f*), with a general indication of the uses to which such land is to be put.

"(*dd*) An estimate of the net cost of the scheme.

"(*ee*) Draft regulations and details of the scheme under the clauses which it is proposed to apply; and

"(*ff*) Any other particulars or plans prescribed by Government."

Then of course there is a clause allowing people concerned, the private owners and

others, to object; and then of course the objection has to be dealt with to see whether it is reasonable and whether the scheme may be modified to meet the objection, or if the objection may be overruled.

Then one may pass on to another more important clause: Whenever a scheme is sanctioned, all owners of lands and buildings in the area affected by the scheme who propose to construct or reconstruct or in any way alter or add buildings shall conform in every particular with the requirements of such schemes; and no building shall be constructed or reconstructed in any area in which building is expressly forbidden in the scheme, or which is reserved in the scheme for any purpose incompatible with building. Once a scheme is passed it must be carried out; of course it may be needful subsequently to make some modifications, but it prohibits any one from doing anything which will interfere with the scheme being properly carried out.

Then there are a number of subdivisions dealing with varying cases that may arise. A few of these may be considered sufficiently important for mention.

One section lays it down that:—

"Property required for the purposes of Town-Planning scheme shall be deemed to be land needed for a public purpose, within the meaning of the Land Acquisition Act, 1894, and may be acquired under the said Act modified in the manner provided."

Then there is a clause with regard to the compensation to be paid where an owner's property is injuriously affected; and then, on the other hand, there is one as follows:—

"Where by the making of any Town-Planning scheme any land or building is increased in value, the Municipal Council, if they make a claim for the purpose within the time (if any, limited by the scheme, not being less than three months after the date of publication of a notification of the Governor in Council finally sanctioning a scheme), shall be entitled to recover from the owner of such land or building betterment contribution of one-half of the settled increase in value (whatever that may be determined to be) provided of course that if a deduction is made under the other section from the compensation payable to the owner that ought to be set off against this." One should be set off against the other. It is also suggested that the contribution shall be paid in half-yearly instalments of one-twentieth of the whole amount on the same dates as the property tax. The result of this suggestion is that the man has ten years in which to pay off this amount which has been assessed as the increased value of his property owing to the Town-Planning scheme.

Now I pass on to some of the regulations that have been framed under the English Town-Planning Act. The following list shows the points required to be submitted with the scheme in the way of supplementary information.

Beyond the immediate information connected with the site, the ownership and such things, there is this supplementary information, giving a sort of general idea of the place itself.

"The local authority shall also furnish a statement showing the following particulars with respect to the district of the local authority"—that is the whole district—"that is to say:—

"(*i*) The acreage.

"(*ii*) The population according to the last census.

"(*iii*) The rateable value for the purpose of the poor rate."

There is no equivalent for the poor rate here; instead, one may say "the rateable value for the purposes of taxation."

"(*iv*) The amount in the pound of every rate levied during the three last preceding financial years.

"(*v*) The amount of the balances of the outstanding loans contracted by the local authority and the sum included in such amount in respect of loans for sanitary purposes; and

"(*vi*) The amount of loans sanctioned but not raised, though proposed to be raised, and the sum included in such amount in respect of loans for sanitary purposes."

So it is clearly regarded as important to know to what extent the town or district is indebted on account of sanitary reform. Then we may note one or two other points.

"When the local authority has fully considered and developed its proposals and has decided to prepare a scheme in regard to an area of land in respect of which it has been authorised to prepare a scheme, it shall cause to be printed a draft scheme embodying these proposals, accompanied by various maps. And especially there shall be indicated and distinguished on the said map or maps:—

"Existing main roads.

"Roads repairable by the inhabitants at large.

"Roads on which tramways or light railways (*a*) have been constructed or (*b*) are authorised to be constructed.

"Roads which the local authority propose shall be made as part of the scheme, indicating the widths thereof and any proposals as to the parts thereof to be appropriated or set apart for special purposes, and the connections of such roads and existing roads."

That clause about "parts thereof to be appropriated or set apart for special purposes" refers to uses customary in Europe. Of course tramways and light railways are most important; the distinction between footways and roadways is to be defined. Then there are sometimes cycle tracks, a riding way, a soft surface or turf for horsemen.

"Roads or ways which it is proposed to stop up or divert."

Then we pass on to land. These maps have also to show—

"Land already built upon.

"Land not likely to be used for building purposes.

"Land proposed to be allocated for use as open spaces, private and public."

Of course certain open spaces, like sports clubs and cemeteries, are not public open spaces; but all the same they are open spaces. Playgrounds such as football or cricket grounds, will very often come under the category of private open spaces.

"Land to be used for any other purposes including buildings for manufacturing purposes or buildings of a special character in reference either to the purpose to which they are to be applied or to their height or otherwise, indicating any restrictions proposed as to the number of buildings which may be erected on any portion of land or each acre in any portion of land.

"Land to be acquired by the local authority for any purpose.

"Lines of any existing sewers or any existing pipes or mains for the supply of water, gas or electricity."

So it will be seen that these maps have to be fairly explicit. Then of course subsequently there are other requirements from the local authorities; the question as to what expenditure is permitted under the Act may be briefly referred to. The local authority is allowed to spend money on—

Purchase of land for open spaces.
Purchase of land for other purposes, specifying them.
Purchase of buildings.
Demolition or alteration of buildings.

Compensation in respect of property injuriously affected by the scheme.
Making or alteration of roads or ways.
Sewerage or drainage.
Cost of preparing the scheme.
Other purposes, specifying them.
Then it is asked to prepare a statement of receipts in respect of property increased in value, and other sources.

All this appears rather complicated, but really on examination it is not so complicated as it sounds. Suppose we just reduce it to the barest outline. In brief, the more important features common to all Town-Planning Acts are as follows. These may be embodied in the Act or in regulations issued in accordance with it, but in most cases considerable discretionary power in regard to the variation in details is left to the authority submitting a scheme.

(*a*) Allocation of areas for specific purposes.

(*b*) Alignment of principal roads.

(*c*) Limitation of the number of houses to a given area.

(*d*) Readjustment of boundaries.

(*e*) Readjustment of values. This covers both compensation and receipt from betterment.

(*a*) We have already glanced at this, and seen the various purposes for which land may be allocated, open spaces and religious buildings, and everything of special character. Then there is another class of allocation, namely, limitation of areas for some things that might under certain circumstances be objected to, like a factory, railway yard, and things of that nature. These may be specifically limited under the scheme to suitable areas. Then there are markets. The position of these demands consideration; they must be conveniently placed for both vendor and purchaser—must advertise themselves, as it were, and must be near the railway if there are heavy or bulky goods to be brought by train. Cart stands must be regarded on similar lines.

Factories also must be dealt with in order that the positions chosen fulfil the following conditions:—

First, that they should be an economic success, and, secondly, to be inoffensive to the other activities of the town. So that judgment in regard to this allocation of areas for specific purposes is particularly needed.

(*b*) The alignment of principal roads includes, as we saw provided for, diversion of existing roads and determination of suitable widths. In making a road we have to determine the appropriate width of the road and how far we can make the landowner contribute. When we want to make our main roads of exceptional width, it is usual to pay for the extra land. Very often one is able to get over this difficulty as follows: Assuming that the by-laws say that the width of roads must not be less than 36 feet wide, the landowner may be offered a concession. "We will require the road to be only 25 feet wide here if you can give us ten or fifteen feet of your land in another place where the proposed main road will pass through your property." There will be more agreements of that kind in the future when owners get used to the idea of getting a concession on one road and giving up something on another. The old system was absurd, as whether the road was a busy road or an obscure one, it was required to have a certain definite width.

(*c*) The limitation of the number of houses in a given area is directly included in every Town-Planning Scheme. The number varies from 12 to 20. The maximum to be allowed to be put on a given area should be 20 to the acre. This clause is sometimes very useful, because, having accepted an allowance of a certain number of houses

to the acre, if there is no particular demand for gardens in the district the landowner may be persuaded to form an open space. Supposing he has five acres and says, "I can only put twelve houses per acre; that is sixty houses on the whole. I think my property will be improved if I put a playground or park in the middle." Then you can get a little park or playground out of the owner for nothing, because he does not lose anything by putting his houses a little closer. Such an open space may be a more desirable use for the land than if it were subdivided into private gardens. Therefore we get sixty houses on perhaps four acres, and one acre open space, whereas otherwise the sixty houses would have filled up the five acres. This is the suggested type of bargain between the authority and the landowner as to the arrangement of houses.

(*d*) Readjustment of boundaries is not as much required in England, because most of the estates are comparatively large, but where there are small ownerships it has often to be put in operation. When Town-Planning was instituted in Germany, the properties had been subdivided as they are sometimes here, and the powers were included to cut up the land and re-allocate the areas, because these areas were extremely inconvenient for building purposes—to a large extent narrow strips of agricultural land. If the scheme can be adapted as nearly as possible to existing ownerships, you will find it will probably work much more smoothly. Very often by a little adjustment of road lines it will be possible to retain the ownership of lands very much as it was.

(*e*) As regards readjustment of values one need only say that it is practically necessary to counterbalance the results of new arrangements. Suppose, by making a new road, the traffic on an important highway is diverted. The man who was on the old highway will certainly have to receive compensation, whereas the owner whose land was not on a road, or not on one of any importance, is now on the new highway and should provide money to help to pay that compensation. As we have to compensate for loss in full while we only get half the value of betterment, it is just as well to make the fewest possible readjustments, because you will not get as much betterment as you lose in compensation. So it is best to be as conservative as you can.

One need only add that in all schemes we must not be tied up by rules and rigid by-laws and things of that sort. The object of the Town-Planning Act is to enable men to use their brains rather than try to do things automatically from a book. Imagine that we are looking through a book of by-laws—By-law 10 says so and so; by-law 70 says so and so. This scheme appears a very good one, but it contravenes by-law 10 and 70; therefore we must have nothing to say to it. That is not the sort of thing we anticipate from the Act. We want people to prepare Town-Planning Schemes and to see what is the reasonable and sensible thing to do in these cases, to see what the demands are and how these demands can be fulfilled. Under the Act we can set ourselves free to use our brains. Therefore we may be opportunists on the basis of common-sense and not bureaucrats on the basis of by-laws.

Chapter XII.

MADRAS CITY.

The consideration of a city should begin with just a little historical sketch. Of course it must in this case be a very slight sketch indeed, a real historical study of Madras requiring a volume to itself, so that we will only deal with the events which have dictated the structure of the city. We cannot consider the great notabilities of Madras, the eminent people who have taken an active part in its life, we can review only the things that have affected its actual mass and form. In such a study as this, one would naturally begin with San Thomé, by far the oldest part of the great agglomeration of towns and villages now included with the municipal limits of Madras, but it is not here possible to review the interesting history of this place, such an investigation would, by itself, form material for a treatise; and we will therefore pass at once to the period when the first East India Company founded Fort St. George.

Francis Day obtained in 1639 a grant of land here from the Naik Darmarla Venkatadri and the first fort was begun on March 1st, 1640—nearly square, 100 yards North to South and 100 East to West. In 1714 it became Fort Square.

Madraspatam was adjacent on the north, that is to say, it occupied the northern portion of the present fort, the area around this, and possibly extended to where the railway station is now located. The Rivers Elambore and Cooum, ran round this place and entered the sea about half a mile to the south. A little cut was made between these two rivers near where the present General Hospital stands. This cut was referred to as existing in 1696, so that its formation was quite an early episode in the history of the town. Then gradually, Madras increased in importance, owing to the decline of San Thomé, which was occupied by the French in 1672 and by the Dutch in 1674, and after that was demolished as a fort. Many of the Portuguese moved into Madras, and San Thomé was reduced to a suburb of the much more important Fort St. George and its surroundings. Triplicane was taken into the Company's estates in the year 1658 and grew from that time onwards as another suburb of Madras. Its growth naturally developed from the temple in the centre and was influenced by the proximity of the Nawab's palace. In 1693 Tandiarpet, Pursawalkam, and Egmore were taken over by the Company. In 1700 the European quarter of Fort St. George had begun to be surrounded by gardens. We know that this was the case, because the clearance of these gardens was ordered for safety in order that the Fort might not be approached without those likely to attack it being liable to observation. At this time the Fort and the town of Madraspatam were still contiguous and they were regarded as White Town and Black Town, afterwards becoming one combined city.

About 1705, under Governor Pitt, the island was embanked and planted. The planting was not that now existing, but was a formal layout of quite another pattern.

A short extract from the Council reports is of interest on the point of early Town-Planning :—

"In 1707 the Madras weavers, who, in the exercise of their industry, had purchased Mrs. Heathfield's garden at the junction of Washing Street, petitioned for certain concessions :—

"Here being some beteelas weavers who have petitioned for leave to build houses and conveniences in order to carry on their trade......, but desire to be exempted from all manner of taxes for three years, which is agreed to be granted them. And

whereas they have bought Mrs. Heathfield's garden for that purpose, 'tis ordered that the Gunner lays out the ground, and sees that they build regularly; and that the Secretary accordingly draw them out a cowle."

We do not know if the Gunner went out with a type design in his pocket. At all events we see they began to build regularly. Madras at about this date was described by Thomas Salmon as follows—his description is so very graphic as to be well worth quoting :—

"WHITE TOWN. The fort stands pretty near the middle of the White Town where the Europeans inhabit. This is an oblong square about quarter of a mile in length, but not half so much in breadth. To the northward of the fort are three straight handsome streets, and as many to the south. The buildings are of brick, several of the houses two storeys high, by which I mean they have one floor above the ground floor. Their roofs are flat and covered with a plaister made of sea shells, which no rain can penetrate; and, being secured with battlements, they take the fresh air upon them morning and evening. The walls of these houses are very thick, and the rooms lofty; but what seems peculiar to this country is, the upper floors are laid with bricks instead of boards; but there are not many of these lofty houses, and I question whether there be more than a hundred and twenty houses in the whole White Town. By the dimensions I have given of this place, it may be very well concluded, there are no gardens or very large courtyards before their houses; and indeed they stand pretty close to the street; but the Governor and people of condition have gardens at a little distance from the town. Over against the west gate of the fort is a barrack, or rather one long room where all the Company's soldiers are obliged to lodge when they are off guard; and adjoining to it on the north is a very commodious hospital where they are taken care of when they are sick. At the other end of the soldier's barrack is a mint where the Company coin gold and silver."

"BLACK TOWN. To the northward, adjoining the White Town a much larger fort called the Black Town, where the Portuguese, Indians, Armenians, and a great variety of other people inhabit. This is built in the form of a square, and is better than a mile and a half in circumference, being surrounded with a brick wall seventeen feet thick, with bastions at proper distances after the modern way of fortification : it has also a river on the west and the sea on the east; and to the northward a canal is cut from the river to the sea, which serves for a moat on that side; so that Madras, considering where it stands, might now be reckoned a town of strength if the garrison was answerable to the fortifications; but it consists of no more than three companies of fourscore or a hundred men each, and one-third of these Topazes or Portuguese Indians. The Company indeed entertain two or three hundred of native blacks in their service, and a body of men may be formed out of the inhabitants, who are very numerous; but these would be of little service against a European enemy, or even against the Mogul's troops if there was occasion for them beyond their own walls. The streets of the Black Town are wide, and trees planted in some of them; and having the sea on one side and a river on the other, there are few towns so pleasantly situated or are better supplied; but except some few brick houses the rest are miserable cottages, built with clay and thatched, and not so much as a window to be seen on the outside, or any furniture within, except the mats and carpets they lie on. The houses of the better sort of Madras are of the same materials, and built usually in one form, that is, with a little square in the middle, from whence they receive all their light...., but I must say, notwithstanding all this appearance of poverty, I never was in a place where wealth abounded more, or where ready money was more plentiful twenty years ago .... In this Black Town stands an Armenian church and several little pagodas or Indian Temples; to the latter belong abundance of female choristers or singing women, as

well as priests......They seem also designed to serve the public in another capacity and make up part of the equipage of a great man when he goes abroad ; for every man of figure in the country, I observed, had a number of these singing women run before him ; even the Governor of Fort St. George was attended by fifty of them, as well as by the country music when he went out ; but some of our late Governors, out of their excessive modesty have thought fit to dispense with this piece of grandeur."

"Beyond the Black Town are gardens for half a mile together, planted with mangoes, cocoanuts, guavoes, orange trees, etc., where everybody has the liberty of walking, and may purchase the most delicious fruits for a trifle; but I shall give a plan of the place, from whence the reader will have a juster notion of this noble settlement than he can possibly receive from the best description."

We may add a few sentences from the account by Charles Lockyer.

"The prospect it gives at sea is most delightful ; nor appears it less magnificent by land. The great variety of fine buildings that gracefully overlook its walls affording an inexpressible satisfaction to a curious eye. Towards the land 'tis washed by a fruitful river that every November, half a mile distant, discharges itself into the sea ; the Bar being first cut for its Passage, which proceeding from the west monsoon, would otherwise occasion great damage by overflowing the adjacent country. It runs about two months in a year, closes of itself, and forms a peninsula three miles in circuit, where are kept a great number of sheep and hogs, with a few cows. The soil is so poor, though the Company has not spared charges to improve it, that the cattle would starve did not other meat support them. The streets are straight and wide, paved with brick on each side ; but the middle is deep sand for cars to pass in. Where no houses are, causeways with trees on each side supply the defect ; these being always green render it pleasant to those who otherwise must walk in the sun."

It was about this time Governor Pitt's map was made.

In October 1734, Chintadripetta was founded as a colony to develop the supply of calico.

"None but spinners, weavers, painters, washers, dyers, with priests, and attendants for the temple will be admitted to the new village, to be called Chintadri Pettah."

The declaration of war by France in March 1744, made the strengthening of the Fort an urgent matter. Joseph Smith was brought from Bombay and his plans were sent home on January 31, 1746.

Smith's design for the west front consisted of three new faces, each about 200 yards in length, fronting roughly north-west, west, and south-west, with as many large bastions. The northernmost bastion was 200 yards from Mint Point, and the southernmost was on the river bank opposite Charles Point. The whole constituted a line convex towards the west. It was covered by a wet ditch of considerable width, which was intended to carry the water of the river when the original bed had been filled up. At the time of the French attack in September, only the ditch with its escarp and counterscarp walls had been finished ; but the original design was eventually completed after the rendition of Madras in 1749, and before Lally's siege of Madras in 1759.

Activity on the Fort from 1770 onward led up to its completion about 1783 in almost its present form, except that the southern outworks have been levelled. At the time of the attack and capture by the French, September 1746, and during their occupation, Black Town was levelled to a distance of 400 yards from the fort.

Other clearances north and west of Black Town were afterwards made in anticipation of a Maratta raid.

Black Town appears to have crept back somewhat, as houses worth pagodas 180,000 were destroyed in the preparations for the French siege in 1758. Later on it was found that land in Black Town was being ingeniously acquired by various tricks, and it was decided in 1779 to sell what remained by auction. There was an unoccupied strip down the slight valley termed "Uttopollam" between Muttialpetta and Peddanaigue petta. An auction was proposed but ultimately an offer by Mr. Stephen Popham was accepted, and he afterwards purchased more and laid out a drainage channel. Popham's Broadway runs through the centre of this area.

A strip of ground facing what is now Front Line beach was dealt with about the same time.

The fear of an attack by Hyder Ali resulted in the removal in 1780 of houses and the slight elevation called Hog Hill, where the northern portion of the Ordnance Lines now stands.

The first water supply to Madras was initiated in 1771 and completed in 1783.

Lt. Col. Love's book on Madras, from which most of these notes have been obtained, mentions "the acquisition by Company's servants of building ground in Egmore and Vepery." Triplicane, however, was now the favourite suburb, and the map of 1755 shows that several substantial residences bordered the Mount Road near the Government Garden House, which occupied the site of the present Banqueting Hall. How far they extended along this road is uncertain, but the most remote building of which mention is made was the house of Dr. Turning. This appears to have been situated on the south side of the Triplicane river, a little above the site of the existing Harris Bridge.

After the siege of Madras, the region which was known as the Choultry Plain was regarded as an eligible locality; but one or two pioneers discovered the advantages before the French attack was delivered. In Orme's time the Plain embraced the area, to the south of the Triplicane River, which lay between the Triplicane-San Thomé road on the east and the Long Tank on the west.

Quoting from a Fort St. George consultation, August 1772, in reference to these extensions, we read as follows :—

"The Board confess themselves much embarrassed in respect to the Requests for Grants of Ground. If they grant to one, why not to another? Rank in the service cannot be admitted as a determinate line, and where shall we stop, for the applications that have poured in upon us since the receipt of the Company's Commands leaving such grants to our discretion, give us just cause to apprehend that there will soon be no ground to grant, and thus indeed that embarrassment will cure itself, but it is not fit that all the ground in the environs should thus be given out of the Company's power. The President therefore takes the opportunity of the application now made by one to whom he has been thought partial to put his negative upon his request, as an example that he will do so to every application which shall not be supported with uncontrovertible reasons; and the Board unanimously acquiesce."

Mount Road was widened and re-made in 1796. Other roads followed and the fine suburban avenues of Madras belong mainly to the first half of the nineteenth century.

At the same period Madras possessed an exceptionally able architect in de Haviland the engineer. His works, the Cathedral, St. Andrews Church, and other buildings show both scholarship and imaginative vigour.

The formation of the Buckingham Canal is the only other development that need be noticed until we come to the railway era. We cannot consider that Madras has been particularly fortunate in her railway system. Like many another city, the railways

have been introduced with insufficient consideration of other interests, and the absence of any appreciable variation in level discouraged the provision of bridges. It was obviously impossible that the lines should be at a lower level than the roads and the cost of forming them at a higher one was probably regarded as prohibitive, so that the only alternative were level crossings or costly overbridges.

Possibly the greatest disaster that has ever befallen Madras was the alignment of the South Indian Railway right across the middle of the city. One can only hope that at some time in the future it may be possible to remove this and substitute a connection northward joining up with the broad gauge system. The story of Madras harbour and its vicissitudes is too recent to need comment here.

It is unnecessary to indulge in a panygyric on the beauties of Madras. They are many and are not always fully appreciated by the majority of its inhabitants. If they were, there would be fewer signs of the neglect that we see only too often.

The critic need not be afraid of making adverse comments provided he offers no criticism without pointing out a means of providing a remedy.

Madras strikes one from the very first less as a fine city than as a city possessing the most exceptional possibilities. A fine city has many features that Madras lacks, but few cities on the scale and with the resources of this one could hope to effect so much in the way of beautification.

Many opportunities have been missed in the past, but while with most cities such lapses would be irretrievable here they do not, fortunately, preclude the adoption of a remedial programme for the future.

Passing from this general sketch, and before considering the measures most desirable, it may be well to take up in more detail the consideration of our subject, proceeding by a subdivision of the governing conditions under the various headings set forth in Chapter III. By this course a double purpose is served. We not only analyse the influences which have to be taken account of, but also illustrate in a condensed form the practical working of the civic survey as applied to a particular case, in this instance one of more than ordinary complexity.

A great deal of most valuable work in the direction of investigating the conditions in Madras Town has been done by Messrs. J. Chartres Molony, I.C.S. Alfred Chatterton, James R. Coats, and others, whose reports on various aspects are invaluable for the purpose of realising the nature of the problems before us. Under the appropriate sections quotations from these reports are included, but it should be understood that these represent only a small fraction of a vast amount of work, nearly all of which is of a character justifying its inclusion in a comprehensive civic survey.

Commencing with

(A). THE TOPOGRAPHY.

(1, 2 & 3). Madras Town (Long. $80\frac{1}{2}$ E. lat. 13 N.) is not markedly influenced by variety in geological conditions. The variations in level are slight (see map M.I.), ranging only from 27 feet to 48 feet above datum. The soil is a red loam, with stretches of sand towards the coast, along which there is a considerable body of sea sand travelling from south to north. This travel having been interrupted by the harbour, which acts as a huge groyne, there is now continuous accretion to the south and denundation to the north of this point.

As illustrating this action the following extract from the Port Trust Report 1913-14 may be quoted :—

" Owing, possibly to the large quantities of sand removed from the foreshore for

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construction purposes, the low water line of the south sand accretion has not varied much during the past four years; but below water, to the east of the harbour arm, the sand continues to accumulate. Since the closing of the old entrance in 1910, the 4, 5 and 6 fathom contour lines have moved seawards about 100 or 125 feet; and where, 100 feet east of the old entrance, there was 31 to 32 feet of water in 1910 there is now only 17 feet. The 6-fathom line has advanced northward to a point 800 feet from the head of the sheltering arm, an advance of 600 feet in four years. Hitherto the removal of 30 to 40 thousand tons of sand annually from under the lee of the sheltering arm has sufficed to maintain the depth in the fairway, but as soon as the 6-fathom line shall have reached the head of the arm, dredging operations on a more extended scale will be necessary—unless, in the meantime, steps be taken to cut off the supply of the north moving sand, probably by the lengthening, eastwards, of the existing south arm of the harbour."

(4). There seems little doubt that most of the area occupied by Madras was originally cultivated, principally with cocoanut palms and paddy fields, the usual form of irrigation being employed, *i.e.*, large shallow tanks with their collecting areas and from them distributing channels serving the area below the tank level up to the point at which the collecting area for the next tank commenced. Many of these tanks still remain around the city, though but little used for the purposes of cultivation.

(5 and 6). The climate of Madras is fairly equable, though somewhat humid, the summer heat being frequently tempered by a cool breeze from the S.E. The rainfall, of about 40 inches, occurs mainly during the months of November and December, and it is only following this that the rivers Cooum and Adyar discharge any volume of water into the sea; for the rest of the year the entrances are closed and the waters stagnant. Owing to the humidity, evaporation is less than in dryer parts of India.

It will be seen by the contour map (M.) that the Cooum drains but a small portion of the town area, which was originally organised to retain and utilise almost all the water falling on it. Now that this system of tanks and irrigation has lapsed, water often accumulates in undesirable places.

As may be imagined, the ground water is nowhere very far down, even in the dry season, while during the rains it practically coincides with the surface level over a large proportion of the town area.

(7). Under this head the point chiefly noticeable is the large proportion of unutilised land in the Madras town area. Apart from the central open spaces which have their value in respect to the congested districts around them, there are also stretches of ground that have ceased to be used owing to the abandonment of irrigation, but have not been rendered suitable for building sites or gardens, owing to the lack of provision for the disposal of surface water.

The tanks themselves form a large proportion of this area, and in addition there are extensive compounds of which but little use is made and which are only needed as a protection to the houses they surround against undesirable developments that should be dealt with under a Town-Planning scheme.

Under heading (11) may be included the following statistics prepared by Mr. J. C. Molony in connection with the census of 1911, for the purpose of showing the proportions classified by religion in the various divisions. It will be of interest to compare this with map M.II., which gives approximately the positions occupied by Hindus, Mussulmans, Eurasians, and Europeans. Further statistics quoted were prepared to show

the proportions of the sexes in racial subdivisions and incidentally give an idea of the ethnographical components of the population of Madras.

Division.	Population.	Hindus.	Mussulmans.	Christians.	Others.
I.	20,318	13,976	1,015	5,271	56
II.	40,635	36,276	3,196	1,151	12
III.	15,120	12,502	2,193	327	98
IV.	14,564	9,199	4,771	540	54
V.	19,179	15,477	965	2,672	65
VI.	22,473	15,951	4,087	2,421	14
VII.	37,065	33,769	1,357	1,891	48
VIII.	28,585	27,625	388	90	482
IX.	20,937	19,643	276	962	65
X.	24,979	18,981	5,139	815	44
XI.	41,523	36,638	643	4,176	66
XII.	29,776	22,629	1,798	5,144	205
XIII.	23,717	17,399	2,053	4,176	89
XIV.	11,751	10,105	270	1,372	4
XV.	15,180	11,589	1,384	2,141	66
XVI.	26,752	23,023	1,324	2,356	49
XVII.	38,643	23,215	14,934	483	11
XVIII.	32,851	24,738	7,490	572	51
XIX.	34,358	26,006	5,274	2,806	272
XX.	20,254	17,178	612	2,446	18
TOTAL ..	518,660	415,910	59,168	41,812	1,769

CASTE, RACE, AND RELIGION IN MADRAS TOWN.

Dealing with Hindus, we get the following figures :—

Caste according to linguistic division.	1901			1911		
	Males.	Females.	Total.	Males.	Females.	Total.
Tamil	149,346	147,996	297,360	149,842	143,313	293,165
Telugu	48,123	47,564	95,687	49,757	47,909	97,666
Malayalam	573	100	673	1,270	218	1,488
Canarese	1,229	949	2,178	1,967	1,504	3,471
Oriya	73	119	192	86	24	110
Other Madras ..	7,260	6,151	13,411	10,309	8,903	19,212
Other Foreign ..	539	435	1,028	296	214	510
Not stated	71	48	119	194	94	288
TOTAL	207,286	203,362	410,648	213,731	202,179	415,910

"Now, the first point that strikes us in these figures is the fact that, while Hindus show an increase of 5,262, this figure is reached by a decrease of 4,195 in the Tamil

castes, and an increase of 9,457 elsewhere. Furthermore the decrease in Tamil castes is entirely on the female side; men have increased by 488, while women have decreased by 4,683. The disproportion between the sexes of the Tamil castes, which in 1901 was 1,368, has now risen to 6,539; and this to a large extent accounts for a sex disparity of 11,552 in the Hindu population, and one of 14,270 in the total population of the city.

It is not on the whole surprising that this sex disparity should be found in castes other than Tamil; such are immigrants to the city, and may be expected to leave their women folk behind them; thus an increasing disparity may be accounted for by increasing immigration. But that this disparity should be on the increase among the Tamils in their own chief city is certainly curious.

As regards Mohammedans and Christians no question appears to arise.

Those classified as others (Jew, Buddhist, Parsi, etc.), show a decided increase from a total of 404 (male 272, female 132) in 1901, to 1,769 (male 1,168, female 601) in 1911. As a reason therefore we may assign the presence of some Buddhist missionaries in the city, and an increased immigration of Parsis. The sex ratio of the city has been influenced somewhat by these figures. There is in women a natural slowness to change an ancient faith (on the side of Buddhist conversion), and a natural tendency for immigrants to leave their women folk behind."

These racial differences are not so specifically located as to be capable of more than general definition on a map (see M.II.), though in some parts of the town it might be possible to prepare to a large scale a map showing such locations in more detail.

Reference has not been made to headings 8, 9, 10, and 12, but these might of course be of use in the preparation of a fuller study of Madras, going back to earlier times, as would be usual in the case of places of greater antiquity.

(B) HISTORY AND ARCHÆOLOGY.

This section has been partially dealt with in the introductory remarks, but these may be supplemented by further details as classified under headings 2, 3, 4, 5, and 6, which would add value to a comprehensive study, though beyond the scope of an outline one such as this. As regards 7, 8, and 9, the main feature of Madras is Fort St. George, which has always formed the focus of the town, points of subsidiary interest being found in S. Thomé, Chepauk, and the principal temples, mosques, and churches. The general defences of the Fort may well be preserved, as though their military value is slight, little is to be gained by their destruction and the loss of traditional continuity would be great. A complete review of all the features of historic and archæological interest, though not necessary here, would form an essential part of a complete survey of Madras.

(C) TRAFFIC.

That the traffic problems are less acute than in most cities of equal size, is due to the fact that Madras as a whole is spread over a wide area with large open spaces between its congested districts. In these districts themselves there will be found a certain amount of traffic congestion while the road facilities need amendment with a view to avoiding delays and the provision of more direct routes from point to point.

(1) The railway system of Madras is still developing, but the development is being considered without regard to the other requirements. The main object at the moment is the improvement of the lines of access to the harbour in order to give increased carrying power for goods. There is in addition a growing suburban traffic which only needs encouragement to exercise a beneficial influence in relieving the housing congestion in the central districts.

(2) It is recognised that the tramway system is also ripe for extension, and that the routes may profitably be lengthened in several directions. This question must naturally be considered in conjunction with 3 and 4, as it is desirable that some degree of classification should be made with regard to the roads, reserving some for fast traffic to most of which trams can be admitted, while those most used for heavy and slow traffic should be kept as distinct as possible from the first named.

Footpaths are not very general in Madras; were they provided on the main roads, pedestrians would soon become accustomed to using them, and a great source of obstruction to traffic would be removed.

A detailed traffic census on the main lines of route in Madras would be of value, but there are certain areas where improvement or diversion is obviously required, namely—George Town, Chintadrapet, and Triplicane, while some of the numerous level crossings cause at times considerable obstruction and delay.

(5) Waterways are represented by the lower reaches of the River Cooum and the Buckingham Canal which passes right through the town from north to south. Comparatively little use is made of this means of transport, and it may be assumed that this is to some extent due to the fact that there is no connection between these waterways and the harbour. Should it be practicable to extend the system of waterways such a course would help to solve the problem of storm water disposal, which is unusually difficult owing to the very slight variations of level.

(6, 7 & 8) The construction of roads, their adequacy, intersections, etc., afford opportunities for more detailed study.

(9 & 10) The treatment of bridges, railway stations, etc., introduce matters of special importance in the improvement of Madras.

(11) Public vehicles and kindred matters may be passed over at this stage.

(D) GROWTH AND DEVELOPMENT.

(1) The growth of Madras has taken place under conditions so abnormal that comparison with other cities is of less value than in most cases. The area within the present boundary includes no less than three distinct towns, namely, George Town, Triplicane with Chintadrapet, and S. Thomé, while numerous other villages are distributed around these according as land was found suitable or available for building purposes. To the west and south the remainder of the ground is mainly occupied by large houses and their compounds. To the North and North-West will be found the larger factories, while the unoccupied land is either cultivated or unused.

(2) These circumstances have resulted in the formation of a number of subsidiary centres, in many cases too accidental to be mutually convenient. While retail trade can accommodate itself to subdivision, the administrative and commercial functions of a large city demand more organisation as to locality than is at present to be found. A reference to the plan of Madras will show that the Government and Administrative buildings are widely scattered, while the commercial centre around the harbour lacks good communications with the districts where many of those engaged there reside. Map M.III. shows the widely distributed quarters where various occupations are carried on.

(3 & 4) Map M.IV. shows the relative density of population and indicates very clearly how congestion is due less to scarcity of land than to failures in providing for an ordered city growth. Immediately to the west of overcrowded George Town is an area but little occupied owing to its having been cut off by the railway and the Buckingham Canal, which have at the same time put difficulties in the way of adequate surface drainage. In other directions want of good access has militated against the natural development of suitable sites while the lack of powers for the allocation of areas for

special classes of development has caused the holding up of land as a barrier against extensions regarded as undesirable.

The following extracts from the report on the 1911 census give some idea of the distribution and movement of the population :—

Division of Madras.	PERSONS.		
	1911	1901	1891
	2	3	4
I	20,318	21,190	21,705
II	40,635	46,512	36,984
III	15,120	16,454	13,086
IV	14,564	*17,856	12,017
V	19,179	*17,557	20,409
VI	22,473	26,550	27,031
VII	37,065	38,403	36,287
VIII	28,585	28,668	26,462
IX	20,937	22,304	21,636
X	24,979	23,223	17,488
XI	41,523	37,106	30,965
XII	29,776	26,960	24,499
XIII	23,717	21,954	18,084
XIV	11,751	9,546	8,880
XV	15,180	14,297	12,710
XVI	26,752	26,624	22,823
XVII	38,643	35,779	29,970
XVIII	32,851	31,451	28,495
XIX	34,358	30,114	26,057
XX	20,254	16,798	15,052
Miscellaneous	..	..	1,878
TOTAL	518,660	509,346	452,518

* Figures doubtful.

" The movement of population in the City of Madras for the past forty years can be seen thus :—

1871	397,552
1881	405,848
1891	452,518
1901	509,346
1911	518,660

" The decennial increase has been—

	Absolute.	Per cent.
1871–81	8,286	2·1
1881–91	46,670	11·5
1891–01	56,828	12·6
1901–11	9,314	1·8

" Thus the increase, absolute and proportional, for the past decade is immeasurably below that of the preceding two decades. Although the absolute increase is slightly greater than that of the decade of 1871–81, in which occurred the great famine of 1877, the percentage increase is lower.

" It cannot be denied that these results have to a large extent falsified expectations.

" I think then we must look for explanation in what I shall call ' mechanical ' or ' natural ' causes.

" By ' mechanical ' causes I understand of removal of large defined bodies of men from the city limits, cessation of large industries, or completion of large temporary works, removal of people to suburbs outside the city area, emigration and immigration. By ' natural ' or a diminishing fecundity of the people.

" The Gun Carriage Factory in Poonamallee Road, which at the census of 1901 was employng some thousands of hands, had been closed down by the census time of 1911. There has been a total increase of 6,013 in certain residential quarters outside the city municipal limits.

" No doubt all these causes may have contributed to the detriment of increase in the city. Yet even if we suppose their value to have been 15,000 in the decade, and add such number to the actual ascertained increase, we only get a total increase of 24,314 (or 4·8 per cent.), which still contrasts very unfavourably with the figures of the two preceding decades.

" Figures seem to indicate that between 1891 and 1901 it was becoming increasingly worth a man's while, if he was born in Madras, to remain there, while for the decade 1901–1911 the conditions seem to have been reversed. Women born in the city seem to be leaving it in increasing numbers ; possibly owing to the rate for sons-in-law ruling lower in the mufassal than in the city ; possibly because for caste and other social reasons the daughters of immigrants are given away in marriage at their ancestral homes.

" Immigration figures show that the city is losing its attractiveness. An increase of 12,720 immigrants between 1901 and 1911 compare poorly with one of 33,451 between 1891 and 1901.

" But it is very questionable whether this drying up of the stream of immigration to the city is any cause for lamentation. It may be a sign, and I think it is a sign, that industry is spreading surely if slowly throughout the Presidency, instead of being confined to its capital town ; that the labourer is growing more assured of a decent life in his own homeland, and more distasteful of the huddled dreariness of the city of slums.

" Finally we may glance at the question of extra-Indian emigration. For Burma, where, I am informed by Dr. Nair, mills are run well nigh entirely by Madras labour, 1,200,000 left the Presidency in the decade 1901–1911. Of these some 325,000 sailed from the port of Madras. Less than one million have returned in the same period, the net loss to the Presidency being over 270,000. It is but fair to assume that a certain proportion of these emigrants were inhabitants of the city, while many more from outside districts, had they not gone to Burma, would have drifted into Madras."

The proper complement to these and further statistics would be a map showing the extent of the town at various dates. The exceptional variations in density and types of land occupation would, however, in this case render such a map quite illusory in effect. For many decades the increase has been confined to areas very small relatively to the whole of the occupied districts.

(E) HOUSING.

(1) Almost every grade of house may be found in Madras, beginning at the huts of the fisher village and the paracheri, and rising stage by stage to the mansion in its own park.

One of the chief difficulties lies in the fact that every class of house is wanted everywhere, and though in all districts likely to be closely built on, kutcha building cannot be permitted, it will be long before all the inhabitants of the town will be able to afford solidly built houses. The present kutcha villages will have to remain for some time to come, and where they are isolated, drained, and their buildings not too closely compacted together, no great practical harm should ensue, little as one would desire to see these developments as part of an important city (see map M.IX.).

The types of house most lacking are the good small house and the small bungalow with a limited amount of garden. There is at present a tendency towards the sub-division of large compounds which may facilitate such a provision, but this procedure urgently demands a comprehensive town plan so that all roads so formed should link up into an orderly road system.

(2) Illustrations of typical Madras houses would form a useful adjunct to this section.

(3) While it may be claimed that all kutcha houses are undesirable, it is clear that their destruction can only be advised where building is, or tends to become, congested. Even more in need of attention are the closely packed and overcrowded dwellings to be found in the south west portion of George Town and in some parts of Triplicane.

(4) Zone plans form part of a fuller survey than this can claim to be. If prepared, they would show in the case of Madras, marked deficiencies in the distribution of schools, parks, etc. Of the remaining headings 5, 6 and 7 apply generally to larger cities, while 8, 9 & 10 might be of service in the case of Madras and its suburbs.

(F) RECREATION.

(1) The central part of Madras is well provided with parks and playgrounds, as in addition to the People's Park, the open ground around Fort St. George and at Chepauk is much used for this purpose.

These positions are convenient for the principal colleges by which they are chiefly used, but the taste for open air games is rapidly extending and Madras will need recreation areas much more widely distributed.

(2) Private recreation grounds are mainly of public value as securing the reservation of open space and with this in view it is important to ascertain as to how long they are likely to be maintained as such. Grounds belonging to colleges, clubs, and other institutions come in this category.

(3) Other open spaces may be permanent but not available for recreation as in the case of cemeteries, reservoirs, tanks, etc.; they should be taken account of as influencing the density of building permissible in their neighbourhood.

(4) The use of waste land for casual games, etc., is of value in forming an opinion as to the need for a permanent park in the locality.

(5) Madras possesses a number of very fine avenues, some of which are suffering from neglect in replacing trees, and a promenade of quite exceptional character in the Marina, extending from Fort St. George to S. Thomé.

(6) Public buildings for recreative purposes are few in number though possibly sufficient for the present needs of the city. In considering these and also 7 and 8, we have to take into account that the needs of India are not those of Europe, though there are signs that in the future there may be some degree of approximation.

(9) Private places of entertainment are mainly clubs, theatres, and cinema halls. It is needless to dwell on the popularity of the club with Europeans, and the Indian is following suit. The theatre is not quite fully developed in India, and has yet to adapt itself to the conditions of the country. Much might be learned from the type

of building and entertainment in vogue on the European continent. The same remarks apply to a less degree to the cinema halls.

(G) GARDEN SUBURBS AND CITIES.

Development on these lines has as yet hardly begun around Madras, though a small co-operative housing society has been formed. It may be anticipated, however, that the areas outside the municipal boundary will give opportunities for housing of this type if regulations are framed to encourage it and to discourage the haphazard developments now general.

(H) EDUCATION.

Primary and Secondary education has yet to become fully recognised in India, and consequently a systematic survey under (1) would not be very illuminating. At the same time schools are provided wherever the demand makes itself felt, and for more advanced studies Madras is a notable educational centre. (2, 3, 4 and 5), are certainly worth including in a survey of educational resources.

As a contribution to these studies the following extracts may be included :—

" On a general view the progress of education (or at least literacy) in the city would appear to be satisfactory. The standard of literacy adopted at the census and that of 1901 was ability to write a letter and to read the answer to it. A brief comparative statement is subjoined :—

Year.	Hindus.				Mohammedans.				Christians.			
	Literate.		Literate in English.		Literate.		Literate in English.		Literate.		Literate in English.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1901 ..	70,399	12,179	24,947	534	9,457	1,049	2,202	17	12,310	9,828	8,853	7,079
1911 ..	86,630	19,681	34,592	1,089	11,674	2,135	3,056	74	13,045	10,516	10,143	7,424

The vitality of progress of education may, generally speaking, be judged by the variation in the proportion of educated children to educated adults. If the proportion falls, then an uneducated generation is growing up ; if it rises, then we may look for improvement among the coming adults, who are to be the strength of the community. The following figures show the proportion of literates age 0–15 to 1,000 literates aged 20 and over :—

	Males.		Females.	
	1901	1911	1901	1911
All religions	181	166	450	385
Hindus....................	175	162	496	423
Mohammedan	133	136	341	320
Christian	258	221	409	333

Now these figures look discouraging, but a little reflection shows that the bogie set up may very easily be knocked over. These figures are, I believe, the result of that falling off in the total number of children to which reference has already been made.

This fact is indeed made abundantly clear by the following statement :—

Religion.	Proportional increase or decrease of population at age 0–15		Proportional increase or decrease of literates at age 0–15	
	Male.	Female.	Male.	Female.
	1901 to 1911	1901 to 1911	1901 to 1911	1901 to 1911
All religions	–3 ·8	–5 ·4	12 ·8	26 ·8
Hindus.....................	–4 ·9	–6 ·4	15 ·3	46 ·0
Mohammedan.............	–2 ·8	–1 ·6	25 ·0	95 ·9
Christian	–4 ·3	– 3 ·5	–6 ·0	–7 ·1

Thus we see that while children have decreased in numbers, they have improved in education. For we cannot draw the improving but improbable conclusion that Heaven kills off the naughty children who will not attend their lessons. The figures in regard to Christian education are worth consideration, as they may tend to show that the Christians are losing ground, while Hindu and Mohammedan are gaining. Especially is this the case with regard to female education, but the figures may be taken with some reservations. For when absolute numbers are very small, proportional figures are easily influenced, and are apt to be misleading."

Headings 6, 7 and 8 are extensions of this subject which can only be dealt with after full and systematic study of these aspects.

(I). ART.

Under this section Madras offers great opportunities. (1) The city, while affording many features of undeniable beauty, lacks the cohesion of more compactly built towns, and consequently fails to convey the impression of dignity that might be expected from its size.

To many it is one of its charms that one can stand in the middle of Madras and see nothing suggesting that there is an important city around the wide Maidan. This attitude may justly be challenged. After all, it would not diminish but rather add to the dignity of this central park if the city presented a good face to it instead of a fringe of mean and unimportant buildings.

Again, Madras suffers from the extraordinary variety of type in structures placed in juxtaposition to each other. There is not a single main thoroughfare but lapses at places into absolute squalor, a variation typical of the city structure throughout. To some extent this is inevitable, as the social needs call for groups of all grades in nearly every part; but the city is, in conjunction with a generally higher standard in housing, capable of very definite improvement in this aspect.

Madras, being almost flat, depends on three things for its elements of beauty, buildings, water, and trees. The last of these only has been at all fully exploited by the formation of parks and avenues. Water areas there are in plenty, but they have

never been re-organised to suit town conditions, and only the magnificent sea frontage and the sweeping curves of the Cooum and the Adyar enhance the beauty of the areas adjacent. There are many dignified and important buildings, though few that have been judiciously placed with a view to the general effect, either in respect to each other or to the natural features.

Again, for nearly a century there seems to have been no definite view as to the style of architecture best suited to the conditions, and the principal buildings exhibit so many experiments in treatment as to destroy the unity that should characterise a great city.

(2) The value of axial planning and of the vista has been ignored; none of the important avenues possesses a terminal feature. These effects of mass, skyline, and balance have been left mainly to chance; in the placing of the buildings and their surroundings there are few signs of considered artistic effort. For example, the compound of the Victoria Technical Institute is opposite Monteith's Road, and nothing could be more obvious than that the building should form a terminal to this road; placed as it is about 80 feet from the axial line it is not visible from Monteith's Road at all. Again the Railway Station, Moore Market, Victoria Hall, and Municipal Offices are strung along in a line regardless of their mass and proportions, forming a very unsatisfactory group.

(3) Madras possesses such great natural beauty that it is the more to be regretted that the growth of the city has tended to conflict with rather than to enhance it. All the original features of the site, such as tanks, watercourses, and palm groves are capable of adaptation to the modified conditions, and had this been done many defects, practical as well as artistic, would not have appeared.

(4) The same criticism that has been made in regard to buildings also applies to the few monuments scattered over Madras, most of which are just dropped down, as it were, where space permitted. A monument should form part of a considered lay-out.

The general appearance of the roads suffers from the almost universal neglect of the compound walls, many of which are allowed to become very dilapidated. This is largely due to the size of the compounds, the proper upkeep which is often beyond the means of the occupier.

(5, 6 and 7) are branches of this section beyond the scope of our present brief review, but which might profitably be taken up in a more extended one.

(K) ENVIRONMENT.

(1) The influence that Madras extends over the surrounding country has several aspects, but the one most important at the present moment is that leading to the formation of suburbs outside the municipal area. Several such districts have better communication with the city centre than the less accessible parts of the town itself, coupled with this the lower taxation and the absence of building regulations tend to promote developments that, owing to the last-named inducement, often take very undesirable forms. Land is sold and houses are built without provision for roads, or any arrangements to ensure proper sanitary conditions. These districts may easily develop into slums if measures are not taken to put them on the same footing as those within the town.

As Madras is outgrowing the boundaries, many of the town's problems, such as those of traffic and health, should be dealt with in conjunction with the outside districts into which the population is flowing. Whether it is desirable to extend the boundaries or not is a matter for consideration, but it is at any rate clear that a city survey should take account of all areas influenced by the city.

(2 and 3) The historical factor may be of some importance in the case of St. Thomas's Mount, while that of beauty demands study in regard to the possible provision of open

spaces accessible from the town. To the N.W. the margins of the Red Tank are especially suitable for development as a public park, and with the probability of improved access by road and rail this may be regarded as part of a system of outer parks for which other sites may be sought for to the south and south-west.

(L) STRUCTURAL METHODS.

There is an unlimited supply of earth suitable for brickmaking around Madras, and brick has always been the main building material. The bulk of the output is, however, of poor quality, and the standard might with advantage be greatly improved.

Formerly brickwork was always faced with chunam, and this is the general practice at the present time, though the quality of the chunam has greatly deteriorated.

The uniformity of practice and the good material used was of value in enhancing the impressiveness of the city. Chunam at its best takes a polish that gives it almost the effect of marble, and it suffers from only one drawback, namely, that where exposed to wet it becomes covered with a black fungoid growth which cannot be removed. Possibly treatment with silicate of soda might discourage this. Whitewashing is often employed, but the effect of a whitewashed building is not comparable with that of one finished in good chunam.

Owing to the heavy rainfall buildings are less liable to dilapidation when placed on a low plinth of impervious material, and parapets suffer if not protected by hard stone or tile.

Stone was generally used for temple work and tank walls, usually the gneiss or charnockite which is the general rock formation in Southern India.

During the last fifty years buildings have been carried out with brick facing and several kinds of stone have been employed. This has been rather destructive to unity of effect, especially where a number of buildings in close juxtaposition have been constructed with differing materials. In the south-east portion of George Town this is particularly noticeable. The adoption of terraced roofs in preference to tiling was formerly more general in Madras than in most southern cities, and the alternative was mainly between the terraced house and the thatched hut. At the same time tiles have always been in use and there seems to be an increasing tendency to employ tiling, using Mangalore tiles for the better class work. Galvanised corrugated iron is also used, though this is both practically and æsthetically unsatisfactory unless covered with tiles. Asbestos tiles have not, so far, been much used in Madras.

The traditional mud building is much in evidence in the paracheries and kuppams included in the town area. It has its merits and for a one storey house placed on a hard foundation and well roofed, it is not a bad method. It ought nevertheless to be discouraged in all areas that may possibly be closely built over.

(M) HYGIENE.

(1 & 2) Are practically covered by section (A) though the results there may be transferred to this in order to indicate their effect on health.

(3) As in (D) there is a map provided showing the density of population, this should be referred to here in connection with those showing rates of mortality, two specimens of which are given (maps M.V. & VI.).

As an indication of present conditions in Madras the following extract from the Administrative Report of 1914–15 is of service :—

" Before men can exercise their minds about finance, education or politics, they must live, and statistics prove that the Madras citizen too often fails to live. In other words the city, or its inhabitants, or both, are unhealthy. For this a good many causes

can be assigned, some I fear, practically irremediable, some remediable partially if not entirely so. Chief among the former causes undoubtedly is the city's extreme flatness, which renders efficient drainage difficult. Poverty is theoretically remediable, but for a long time it will constitute a formidable obstacle in sanitary reform. A large proportion of the population houses itself abominably for the simple reason that it cannot afford to house itself better. A man's roof should be sound, his floor impervious, his room ventilated and of a certain spaciousness. But when food and the scantiest measure of clothing have been provided, there remains but little out of Rs. 15–20 per month towards securing these accommodations.

"Cleanliness, however, promotes health, and Madras undoubtedly might be a great deal cleaner than it is. This is not a discovery; for thirty years and upwards there has been hot recrimination about the failure of 'the executive' to do its duty and 'sweep ye towne cleane and wholesome.'

"What were the conditions of thirty years ago I cannot say, but the blame for Madras' present unsavouriness may, I think, be apportioned fairly equally between 'executive' and 'people.'

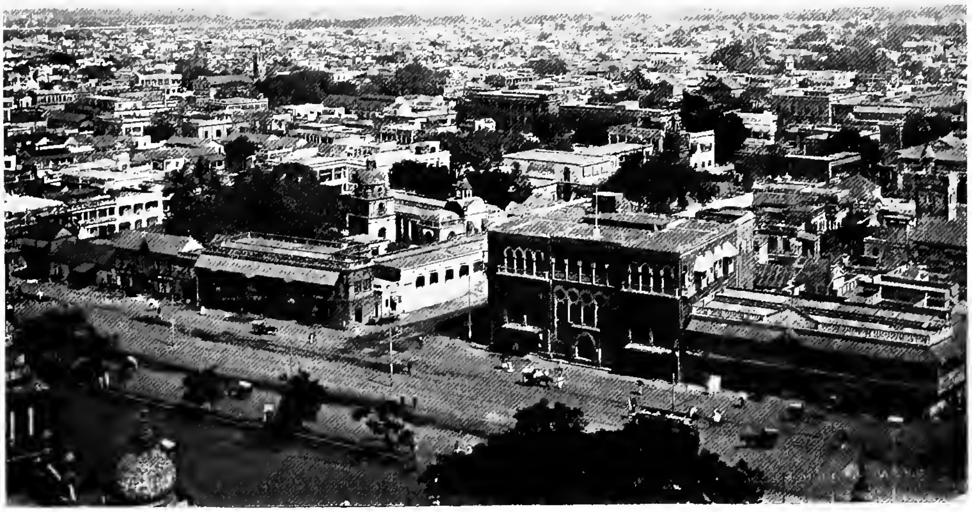
"At the bottom of the executive scale come the sweepers and scavengers. The prejudice of India has assigned to these worthy men a social position rather beneath that of a dog; and when a man has been treated consistently as a dog, it is hardly surprising if at times he exhibits certain doggish characteristics. The sweeper I have found in his lighter moments a companionable soul, but of responsibility or interest in his vocation he has no idea. For a meagre wage he will sweep fairly well so long as he is watched, but no emolument will induce him to sweep if left to himself. He has little or no instinct for cleanliness; probably it does not strike him that, apart from the capricious whim of his paymaster, there is any real reason for removing dirt from the street.

"On the side of the 'people' the fault lies in failure to perceive the necessity for co-operation. A man cannot keep well simply by paying fees to a doctor if he disregards all ordinary rules of health; if half a million people heedlessly render the streets unnecessarily dirty, eleven hundred scavengers, though paid, cannot possibly keep those streets clean.

"Of special importance to the health of the city is the attempt to stamp out malaria. Malaria, as is now generally agreed, is disseminated by mosquitoes; and for these mosquitoes the tanks with which Madras is honeycombed afford ideal breeding grounds. Though all tanks cannot be abolished, there are a great many which serve no useful purpose, and which, in the general interests of the city, should not be allowed a continued existence. The filling of tanks costs money; the corporation cannot possibly pay for all the work that is done, and it is only natural that the private citizens should be reluctant when called on to execute a sanitary improvement which may cost him from three hundred to three thousand rupees. The first efforts of the corporation were met by a blank wall of opposition; it is encouraging to note that a very considerable breach has been made in this wall. The corporation and the public are advancing towards each other; tank owners are beginning to recognise that it is for their own and for the general good that useless ponds and pits should disappear; they expect, and with justice, some municipal aid, but the old attitude of refusal to incur any private expense is largely a thing of the past."

A paragraph from a Sanitary Report by Mr. J. A. Jones may also be included here.

"In Madras there are abundance of tanks, but their regulation is extremely difficult owing to them being mostly in the hands of private parties. There are also many low-lying places full of water during part of the year and during the other portion dry; these are used for many purposes, such as washing cattle, clothes, etc., and thus, while they are drying up poisonous matters are evaporated into the air and when dry



MADRAS. GEORGE TOWN 63

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they send forth from their beds the exhalation of the solid filth collected during the rainy season. Even in few of the masonry tanks connected with Pagodas, etc., is any change of water possible. These are ordinarily fed by springs in their bed, and the only change of water which takes place is caused by evaporation; the solid matter however, accumulated from day to day is by the passage of the people being constantly stirred up and no doubt carried off in considerable quantity in their clothing to their houses."

Under the remaining headings of this section there is a large mass of information available, which only needs to be put into ordered form to go far towards completing the record demanded.

The question of hygiene has for long been regarded as one of crucial importance and while, through lack of funds, action has been delayed, the steps necessary to bring about an improved state of affairs are either being taken or are clearly recognised as desirable.

Under heading (8) it may be noted that until the objects of building regulations are more generally appreciated, great difficulty lies in the way of their enforcement, and while amendments would be advantageous, even in their present form they are apt to be regarded as oppressive and evaded where possible.

The same ideas prevail in regard to (10), the effect of insanitary and dilapidated building on health being but little understood, so that such defects are regarded in far too tolerant a spirit.

(N) ECONOMICS.

(1) Madras possesses numerous industries mainly carried on on a small scale either at, or close to, the homes of those engaged in them. The general distribution of these is shown on map M.III., which gives the location of the people pursuing various avocations.

There are several large factories, the most important being the Carnatic and Buckingham Cotton Mills. It would be useful to have another map showing these and including the positions of industries outside the town, such as the Perambur Railway Works, Brickfields, etc., with diagrams added showing the numbers employed.

A hint as to the industrial position is given in the following extract from a report by Mr. Alfred Chatterton :—

"Although Madras is, in respect to population, the third city in India, it is, from an industrial point of view, of small importance. Founded as factory of the East India Company in the year 1640, it owes its growth to political rather than economic causes. Before the advent of railways and steamers it was as conveniently situated as any other town on the surf-bound Coromandel coast for trading, and, as the centre of the East India Company's administration, it gradually grew into commercial importance, and ultimately, as the capital of the Southern Presidency, it became a city with a large population. In the middle of the nineteenth century it was relatively a town of greater importance than it is now, and in those days indigenous industries flourished, and there was a number of important Government factories. When the East India Company ceased to carry on trade, the foreign business passed almost entirely into the hands of European houses of Agency, and although they displayed considerable enterprise in endeavouring to establish industries on a large scale in the country, their efforts met with little success, and up to the present day trade has proved more remunerative than manufacture."

(2) Transport diagrams can only be prepared from statistics as to the goods handled by rail, road and water. The goods brought by rail to town and to the harbour, those brought by sea for the railway and the town, the amount handled at the harbour

and the various stations, the transport along roads and canals; all considered in relation to the industrial machinery. Traffic problems themselves are dealt with in Section C. What is required here is an economic investigation to ascertain where the requirements of industry are not sufficiently or are unsuitably provided for.

For example, the following extracts from the Port Trust Report of 1913–14 (the last year before the war) give some idea of the business dealt with at the harbour :—

IMPORTS.

" *Coal.*—The imports of coal for the year 1913–14 were 170,465 tons as against 202,996 tons in 1912–13. Practically the whole of the coal handled in 1913–14 was landed at quays and transported by wagon either direct to destination or to the coal stacks in the north coal yard. The cheapness and celerity with which coal can now be discharged direct into wagons from a steamer at a quay is in strong contrast to the conditions which prevailed only two or three years ago.

Timber.—The timber trade of Madras, which consists chiefly of teak from Burma, suffered considerably from the prevailing high prices of teak and from the stronger demand at other ports. These unfavourable conditions resulted in falling off of imports of timber from 24,888 tons to 22,644 tons in the year under review—a decrease of 2,244 tons.

Iron and Steel.—The accommodation and facilities provided in the iron yard were tested to the fullest extent this year, when the imports rose from 30,882 tons in 1912–13 to 59,766 tons in 1913–14, an increase of nearly 100 per cent.

Case Cargo.—A noticeable feature of the year's work is the increase which has taken place in the imports of piece-goods, the quantities being 16,816 tons for last and 22,233 tons for this year. Other important increases are yellow metal, case goods and other similar general cargo.

Sugar.—Under this head the traffic is practically stationary. The figures being last year 20,670 tons and 21,239 tons this year. Dealers in sugar from out-districts find it a great convenience to be able to buy small lots at the shed delivery doors and to book them straight away by railway wagon to destination. The molasses imports all went to Bangalore where they are used in the distilleries.

Horses and Motors.—The number of horses landed was 801, against 746 in the previous year. The imports of motor-cars in 1913–14 were 455, and of motor-cycles 258, against 263 and 315, respectively, last year.

EXPORTS.

Ground Nuts.—The shipments for 1913–14 were 83,332 tons as against 65,618 tons in 1912–13. There is no doubt that, with the exception of certain South Indian Railway stations in the South Arcot district, which can afford to send their produce to Madras instead of Pondicherry and to other southern coast ports, Madras must look to the districts in the north-west, where the area of ground-nut cultivation has been steadily increasing until, from 69,000 acres in 1909–10, it reached the high figures of 230,000 acres in 1912–13.

Cotton.—The following are the shipments of cotton for the last three years :— 1911–12—13,874; 1912–13—16,963; 1913–14—12,170 tons. Had it not been for the increase in the exports of cotton to Japan during the year under review, the trade would have shown even a larger falling off. The decreasing exports of cotton from Madras may partly be traced to the spread of ground-nut cultivation, which in some districts is taking the place of cotton, but chiefly to the diversion of the traffic to Bombay via Marmagao, owing to our higher ocean freights.

Tea.—The facilities provided at Madras for the shipment of exports are now being taken advantage of for the export of tea whenever the west coast ports are closed

during the south-west monsoon. Formerly the practice was to detain shipments of tea until the west coast ports re-opened. The figures for tea exports for 1913–14 are 174 tons as against 4 tons in 1912–13."

(3) The location of movements of workpeople, their wages, and proportion spent on rent and living may also be profitably studied.

(4) The public services of Madras include water, gas and electric supplies, sewerage and methods for its treatment. The cost of these services and how this cost is recouped should be dealt with.

(5) The area of land under cultivation and its productive value is important as influencing other developments.

(6 and 7) These aspects of industry should not be overlooked though data are wanting to enable them to be dealt with here.

(8) The preparation of unemployment diagrams depends on whether investigation shows that this is an important factor.

(9) The question of financial control is a very wide one and includes both public and private undertakings influencing the economic affairs of the town.

(10) A map giving a general idea of the relative values of land (apart from building) is most useful as a guide in preparing improvement schemes. A sketch study for such a map is given (map M.VII).

(O) LAW AND CUSTOM.

This section would, in the case of Madras, demand special studies which it has not been possible, so far, to undertake.

(P) ADMINISTRATION.

While most of the information under this section is doubtless available, it has yet to be classified and put into suitable form for purposes of investigating possible correlations and amendments.

Chapter XIII.

THE IMPROVEMENT OF MADRAS CITY.

The preliminary study of Madras in its present state, incomplete though it may be, brings forcibly before us the main points towards which our efforts for improvement should be directed.

SURFACE DRAINAGE.

Apart from the work of sewerage and sanitary improvement at present in hand, the foremost need is for an organised system of surface drainage for storm water, with adequate channels following the natural lines of drainage and where possible the linking up the tanks, which would be reduced in area so as to take their proper place in the city plan. In conjunction with this the improvement of the River Cooum and the development of the system of waterways is dealt with. A tentative sketch is given in map M.VIII. showing suggested lines for main drainage channels and waterways as well as railway developments (dealt with subsequently).

In the first place the north-western area demands consideration. This part of the town lies so low that it is still largely undeveloped in spite of its proximity to the business and industrial quarters, and where portions have been occupied the conditions are most unsatisfactory. If a really adequate scheme for surface drainage were provided, this district would become of value for extensions. Such a scheme is outlined on the plan, with a main channel large enough for use in transporting goods, thus assisting commercial developments.

In the centre and western portions of the town, the river Cooum forms the natural drainage channel, and this may be linked up with the north-western channel so that both may be carried to outlet sluices delivering into the proposed outer harbour.

During the rainy season, the Cooum breaks through the sand bar at its natural outlet, and this would still take place, while if a groyne were provided on the south side of the temporary outlet, it would be kept open to the tides for some time longer than is at present the case. This groyne would also hold up a body of sand in front of the Marina that would otherwise flow on to the harbour breakwater.

In the south-western portion of the town there is at present a gradual development, and as the fall eastward is very slight, it is most desirable that some good channels should be formed for draining this area. Suitable lines for these are shown on the plan.

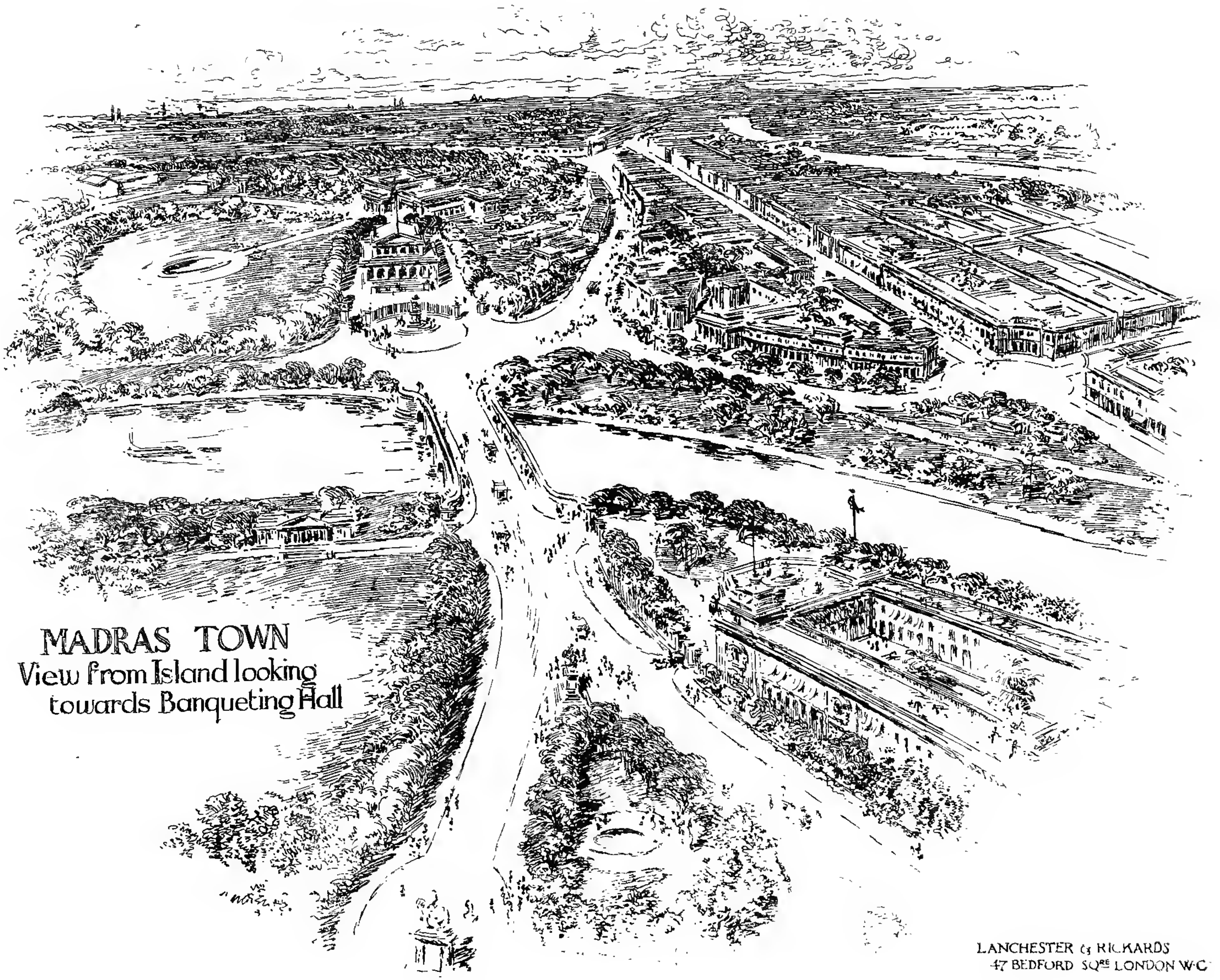
In all these cases the ground excavated and also the useless spoil banks along the Buckingham Canal would be of value in filling low-lying ground and arranging the surface levels to fall systematically towards the lines of drainage.

RAILWAY DEVELOPMENT.

Madras is served by both broad and metre gauge railways, the former coming in from the north and west, and the latter from the south.

It is proposed to introduce another metre gauge line from the north-west, and a route has already been plotted for this. This route, by reason of the number of level crossings involved, is most undesirable from the point of view of general convenience, and even if the alternative one shown on the map No. M.VIII. is initially slightly more expensive, which is uncertain, it would more than save any increased cost in subsequent convenience.

The introduction of this new metre gauge line from Renigunta introduces another problem, namely its connection with the existing South Indian Railway. Up to the


MADRAS TOWN
View from Island looking
towards Banqueting Hall
LANCHESTER & RICKARDS
47 BEDFORD SQRE LONDON W.C.

present, the only short connection foreshadowed is in the port area, a position much too valuable for marshalling purposes. Moreover, any increase of traffic on the line crossing the Maidan is to be deprecated.

It is clearly desirable that a link line should join the southern and north-western metre gauge more or less on the route shown on the map. This would enable the northern portion of the harbour to be allotted to metre gauge services, leaving the southern to the broad gauge.

THE ROAD SYSTEM.

As the system of roads forms, as it were, the framework of the city it is convenient to deal with this before considering the allocation of areas, although the latter factor must of course influence the provision of main roads and will dictate the scheme of minor roads.

Main roads fall into three classes: those within the built-up districts designed to improve traffic facilities, those carried into more open areas in order to develop these, and those providing for improved communication between the town and surrounding country. Many roads combine more than one of these functions.

In consequence of the extreme variation in the speed of vehicles, the Indian town demands a more liberal provision of roads than the European one, in proportion to the total amount of traffic. The only means of minimising this is the allocation of roads for slow and fast traffic, a course that in the case of Madras could only be adopted to a very limited extent on account of the lack of specialisation in the use of the various areas throughout the city.

The plan proposed provides, however, for the selection of some main roads which could be formed with a view to encouraging fast vehicles and eliminating slow ones. It will be seen from the map (No. M.IX), that alternative main routes are available in almost every direction.

One of the chief difficulties in the existing communications of Madras lies in the impossibility of passing between the north and south sections of the city, except by one of the level crossings over the South Indian Railway. In some cases it would not be difficult to provide overbridges, and three of these are shown on the improvement scheme. (See map M.XI.).

The roads around the open Maidan have been rearranged partly to facilitate the provision of these overbridges, and partly to provide good sites for important buildings intended to enhance the dignity of this central area by a ring of fine facades looking on to it. Advantage has been taken of the proposed reconstruction of the Mount Road bridge to shift its position so as to secure a dignified entrance to Government House, with the approach vista terminated by the Banqueting Hall. (See 65).

Another point to be considered is the limited provision of good frontages for important business premises on Front-line Beach. By opening up squares running back from this road further good sites may be secured, and suggestions are made with this object in view. Again the proposed thoroughfare running west from the harbour gates gives good opportunities in this direction, and as a new Custom House will become a necessity in the near future, the existing one may well be removed to the site provided immediately north of the present building.

In the outer parts of the town, many of the larger compounds are likely to be divided up to meet the need for smaller and less expensive bungalows, and the road system shown provides for this as part of an organised scheme, not destroying useful buildings, while giving frontages for plots of half an acre upwards. Of course, such a scheme would only be carried out by degrees, but if determined from the start it ensures a good lay-out instead of a series of makeshifts, at no extra cost.

In some areas roads are shown more closely placed, as would be necessary for houses of a smaller class, and the widths and construction of the roads would be proportioned to the probable traffic needs.

The suggested treatment of the sea front demands a brief note. The accumulation of sand is gradually transforming the Marina from a coastal into an inland route, and at some future date it will evidently be possible to form a new drive further east, which with its extensions north and south will be even more magnificent than the present road, while the latter can then become a main artery with buildings on both sides in its way no less attractive than its newer rival along the shore.

TRAMWAYS.

In conjunction with the general road system, that of the tramways has to be considered.

Now the trams are at present largely used and are increasing in popularity as a means of locomotion, so that it is urgently necessary to provide that extensions shall not be haphazard, but shall tend towards the completion of a clear and simply organised system that shall meet the traffic needs of the wide area of the town.

Most of the lines have been laid by the side of the road, a method generally recognised as erroneous except in special cases, but a commencement has been made in shifting these, and it may be assumed that the general lines of existing routes should be maintained. Extensions are planned to serve the areas at present most populated or likely to become so, while with regard to the working system the adoption of a central circuit may be strongly advocated. The suggested routes are numbered, and cars on all these, from 1 to 11, would pass round this circuit, which runs near the most of the important centres.

At any point of this circuit it would be possible to change on to any other car (with the exception of route 12, which is an outer ring route to link up suburban areas). This scheme is much the simplest and more quickly grasped than that of a number of through routes crossing at various points (see map M.X).

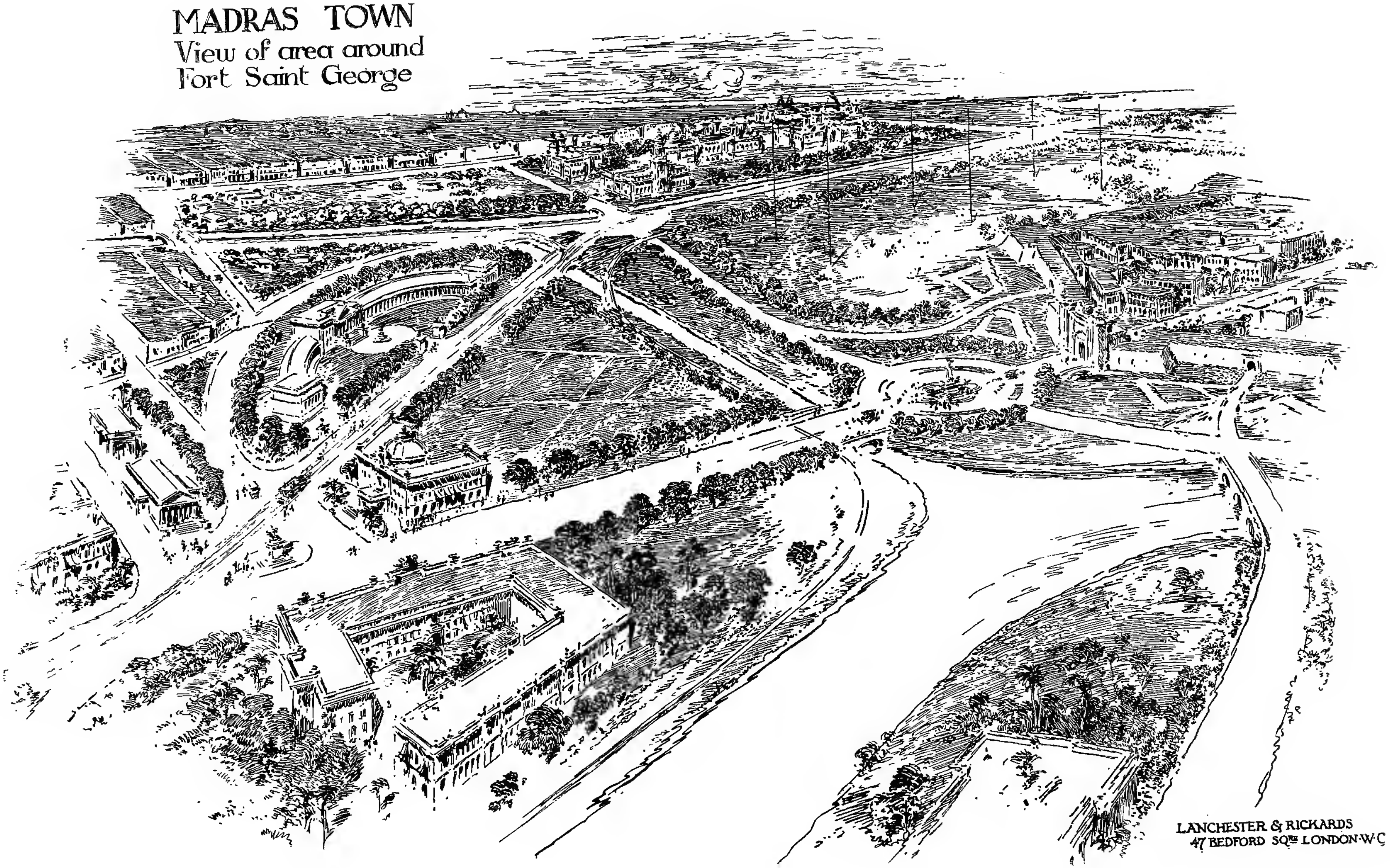
GROUPING OF THE PRINCIPAL BUILDINGS.

One of the most important steps towards the reorganisation of Madras consists of a more logical grouping of the buildings that house the different branches of activity appertaining to a city exercising such varied functions.

Madras is a seat of Government, a commercial centre, an educational centre, and a social nucleus. All these ought to define themselves clearly in the city scheme, and while it is desirable to disturb as little as possible, it is none the less essential to endeavour to rectify the present accidental distribution of the buildings falling under these varying heads.

The Government buildings are widely scattered through the town, and there is no definite administrative centre. Two points seem to be in competition for this position, Fort St. George and Chepauk. Their claims might be fairly equal, but for the fact that education is a strong competitor for the Chepauk area, and this fact turns the balance in favour of Fort St. George. Now within the fort itself there are no sites suitable for secretariats and other official buildings, but around the Maidan to the west there are a number of positions that demand large and important buildings, while to the east of the fort the reclaimed area now practically unemployed could be laid out to a great advantage to accommodate a group of secretariats in proximity to the Council Hall, which is the natural centre around which Government Offices should be located.

The development of the commercial quarter already firmly established on the eastern part of George Town has been dealt with elsewhere, and the adoption of Chepauk as the educational centre is referred to under the head of education.


MADRAS TOWN
View of area around
Fort Saint George
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The social centre cannot be clearly defined, but Government House is obviously the point around which it would group itself. The Madras Club and the principal shops and hotels have already placed themselves a little way to the south-west of the Government House, but northwards towards the Central Station there are sites that might be developed to advantage, as they are at present either unused or employed for purposes relatively unimportant. By placing on the upper end of the island good European and Indian hotels, and between them a suitably designed theatre and opera house (see map M.XI.), the route from the station to Government House and the social centre would be rendered more dignified and interesting. The failure of Madras to convey any impression that it is an important capital and dominant city would by such a course be in large measure remedied.

HOUSING DEVELOPMENTS.

Now, the interdependence of housing and transport facilities is so obvious, that the railway and road schemes are in great measure determined by their utility in opening up areas suitable for housing developments.

At present the area of Madras is very unequally served, and consequently the value of land for residential purposes is very unequal. Some sites, not inherently good, tend to become overcrowded, while others which might be most suitable are neglected through lack of access.

That improved communications would effect a beneficial change will be at once realised when we notice the growth of suburbs along the South Indian Railway. These suburbs doubtless owe part of their popularity to the fact that they are outside the city rating area, and it is a question whether the boundary should not be extended to include them. At the same time, the railway service is only moderately frequent, and this growth has undoubtedly been fostered by the lack of convenient access to many parts of the town area proper.

An extended suburban railway system is less suited to Madras than the improvement of roads and tramway services, and those shown on maps M.IX. and X. leave very few available areas without suitable provision, and consequently permit all the ground within the town to be utilised for the purposes for which it is most suitable. The tendency to congestion in George Town would be accentuated by the improvement proposed in the interests of commerce and traffic, if provision were not made for a conveniently placed extension. This is suggested to the north-west, and the roads have been planned accordingly.

Development here includes sites for factories, so that this extension would be needed for industrial workers, and would give an opportunity for housing these on sound principles with the avoidance of overcrowding.

Congestion in other parts of the city will be gradually relieved by the increased provision of sites suitable for the poorer classes. The standard of building would of course be raised as far as practicable, but as for economic reasons it would be impossible to insist on a uniformly high standard, the most appropriate alternative is the allocation of areas for superior and inferior buildings. By so doing the paracharies and kuppams may be permitted to remain in a certain degree of isolation, and even, if it be necessary, a proportion of kutcha building may be carried on in specified areas, on a lay-out to be approved within limits to be clearly defined. The ground allocated to each group should be sufficient to provide one acre for every 50 persons, and no group should accommodate more than 1,000.

For the sake of order and tidiness, part of the space allotted to these kutcha "villages" should take the form of a marginal strip planted with shrubs and palms, while it is almost superfluous to add that the sites should be graded to throw off surface

water and deliver it into a channel, apart from the provision of such system of sanitation as may be practicable.

On the road map will be found the sites suggested for this form of development.

With regard to the better class of buildings the main requirement would be the extension of the sewerage and other services. The order in which sites could be developed would largely depend on this, and it would have to be borne in mind that desirable as an open lay-out would be, it might render prohibitive the provision of houses for the poorer classes, owing to the high expenditure on roads and sewers.

Areas suitable for this class of development are also to be found on the road map. Where the roads are more widely spaced, it may be assumed that building would take the form of detached houses in compounds of varying size.

PROVISION OF OPEN SPACES.

It has been pointed out that the centre of Madras has a liberal allowance of open space. In fact there is so much that a few sites could well be spared from it on which to place important buildings that would enhance the effect of this area. On the other hand, outside the centre the city is spreading without the provision of good parks and recreation grounds. It may be imagined that the cost of providing and maintaining these would be prohibitive, but this would not be the case, as all that is necessary for the moment is the reservation of areas of little value, which in large measure need not be diverted from their present uses, and would only be taken up for public use as the requirement arises.

The main group of outer open spaces for Madras is best secured by the reservation of a broad belt to the west of the town comprising Mambalam and Nungambakam tanks to the south-west, then running north-westward outside the municipal boundary to Perijakudal, and from there northward to the west of Perambur workshops, joining up with an open strip including, and running west from, the Vyasarpadi tank about a mile north-west of Peravallur. From this point it would be desirable to provide an open strip running north-westward to link up with park reservations around the Red Hills tank. See small scale map M.XII.

Inside this belt a number of smaller parks will be needed in order to provide play-grounds, etc., near the homes of the people. Suggestions for the sites of these will be found on the road map M.IX. These form a ring of open spaces around the more densely populated areas. The mode of use for these small parks would be dictated by the requirements of those living near them. Probably they would combine playgrounds with small groves for rest and quiet.

EDUCATIONAL FACILITIES.

It is not at this stage that detailed proposals for the location of primary and secondary schools can conveniently be introduced, beyond recognising that these should be fairly proportioned to the needs of the present and probable population and the requirements of the various classes. Sites of suitable size to provide for both outdoor and indoor educational exercises should be reserved under a general scheme.

With respect to the more advanced studies, Madras is naturally the centre for a large area, and great developments may be expected in both the university and its allied colleges. Every effort should be made to form these into a group both by reason of economy in control and the advantages of mutual proximity as regards playgrounds, etc. Now such a group is already partially established at Chepauk, though at present it is mixed up with Government Secretariats here. These Secretariats should be given up and turned over to the collegiate institutions.

The Christian College is not well placed at present, occupying a cramped site,

obviously more suited to commercial purposes. It is worth while to consider whether it should not be transferred to Chepauk.

Exceptions to this grouping must be admitted in the case of the Law College, which is properly placed in proximity to the Courts and the Medical College, which must inevitably be run in conjunction with the General Hospital.

In regard to the removal of the Engineering College to Guindy, there appear to be arguments both for and against such a course, but these already having been dealt with by those competent to judge, it is perhaps hardly desirable to reopen this question.

If the spare land in Chepauk and along the Marina is skilfully made use of, it should provide for all the needs of the Madras Collegiate group, and some of the area now in process of reclamation between the Marina and the sea will provide excellent recreation grounds for the students.

HYGIENIC CONSIDERATIONS.

So much has been done and is at present in hand towards the improvement of the general condition of Madras in respect to health, that though the need for improvement is great, the remedies may be regarded as understood and, as far as means will permit, being put in operation. Without doubt a more comprehensive organisation of the city as a whole would facilitate these measures, and this is a potent reason for advocating such a course. Incidentally the improved surface drainage previously dealt with would be of great service, but the most important factor is the general low standard of living and housing. While there is a noticeable tendency towards improvement in this respect, the movement is very slow, and an active propaganda is needed to induce better ideals. It may be thought that the people are living as well as they can afford, but this is untrue, as the fact is that being content with little they do not trouble to earn more. Anyone who found his needs expand could soon increase his earning capacity. Again it is not by any means entirely a question of money, life in a town demands a continuity of effort with regard to ordered and cleanly living, if disease is to be combated, and this effort must become habitual with town dwellers. So far this has not been the case, but it may be hoped that such a requirement will gradually become better realised.

The medical services of Madras are good and improving. The main question at the moment is that of reconstruction of the General Hospital. Without question the present building is obsolescent and its site inadequate, besides being not very suitably placed. The proposed removal of the hospital to the Spur Tank seems the best course, and in the road scheme this has been accepted, the south-west portion of the tank area being allocated for the hospital with the north-west portion for the new Medical College.

This leaves the present hospital site free for the central remodelling of the roads, etc., while the existing Medical College would be taken over for other purposes.

In connection with the hospital services a good convalescent home would be of value, and it may be suggested that a suitable site in proximity to the outer park system might be provided.

COMMERCIAL DEVELOPMENTS.

Despite the increasing importance of Madras as a commercial centre it may be doubted if the possibilities of the future in this respect have yet been fully realised. The large area for which, given good harbour facilities, this is the natural outlet, is at present far from reaching its maximum output; this is for the moment not so much limited by its inherent productiveness as by the competition of other districts in an

even less advanced stage of cultivation. With competition of this character extending as it does from Africa to Japan, it can easily be realised that development may not be rapid, and that there may be periods when it is almost at a standstill. At the same time, the improved conditions of life in Southern India, fostering an increase in population, will bring pressure to bear on agricultural and kindred activities that will result in a greater productivity.

This alone would have some effect on commerce, but there is in addition the increasing extent to which exchange and barter is found advantageous in the world's economy and the consequent increase in the business of transport relatively to the energy devoted to initial production.

On these grounds it may safely be predicted that the trade of Madras will exhibit a steady increment and that therefore an improvement scheme must provide for a gradual growth of facilities to meet these conditions.

The harbour takes the primary place in such a programme and forms, as it were, the key controlling such subsidiary requirements as railways, warehouses, factories, and other business premises. Now Madras harbour has had a short but vigorous life; its structure is now, by the completion of the land wharf, only just reaching its most efficient form, and there is good ground for believing that this will not do more than meet the needs of the near future.

The difficulty of the sand accretion has been recognised (see the Port Trust Report, 1913-14, previously quoted), and the problem before the Trust appears to be the extension of the harbour on the seaward side in such a manner as to provide for this and at the same time utilise the works for possible future commercial requirements. Furthermore, there is the trouble caused by the denudation immediately to the north of the present harbour, a point where land would become of value for commercial purposes. Taking these several matters into account, it seems worth while to lay down general lines for an extended harbour, (see map M.VIII). Of course this question is primarily one for the expert advisers of the Port Trust, but in a comprehensive improvement scheme it is hardly practicable to avoid including, in sketch form, some indications of possible harbour extensions, in which the matter of accretion, denudation and transport facilities have been borne in mind.

The suggested eastern basin enables the inland waterways to be connected with the harbour without disturbing the existing works, and would also permit of the present eastern arm being used as wharfage. The northward extension would cover the foreshore now being denuded at a point where railway access is most easily secured.

It cannot be claimed that denudation will not continue still further north, but at all events the cost of protecting three-quarters of a mile of the more valuable frontage would be saved, while further on the effect of denudation might be mitigated by the deposition of sand dredged from the harbour channel. Even if this were not done, the loss would be less owing to the lower value of the land.

Turning to the other questions relating to commerce and industry, the development of the railway system has already been outlined, while in close connection with this would be the allocation of sites for the larger factories, which demand railway and sometimes water facilities. Suggested positions are marked on the railway map (M.VIII).

The improvement and extension of the area for business premises has been touched on under the suggestions for a road system, but it may also be pointed out that should the harbour be extended northward, the sites at the northern end of Front Line Beach would be of enhanced value for this purpose. Having regard to the special value of these frontages for business premises, sites here should not be employed for other classes of building that could with almost equal convenience be placed elsewhere.

FINANCIAL RESOURCES.

In advocating a programme so extensive in its scope, even if it is formulated with the idea of its taking a long term of years to carry out, the objection must be anticipated that the cost would be too great for the resources available.

Even if all the proposals be accepted as desirable in a greater or lesser degree it would be futile to put them forward without some hope of their being financially practicable.

The first impression would undoubtedly be that not a tithe of the suggested works could be undertaken, and it must be frankly admitted that unless all the authorities interested are prepared for a combined effort this would be the case. To begin with, the municipality is not on the present basis of taxation in a position to do more than the ordinary maintenance services; for special expenditure of any kind it has to rely on subsidies.

It is probably undesirable to raise the scale of municipal taxation, and the extension of the municipal boundary while it would increase the income, would increase the expenditure to an equal extent.

The position of Madras as a capital city with corresponding special responsibilities gives it a claim to a more than an ordinary subsidy from Government Funds; this claim has been recognised and liberal grants have been made for various purposes.

These grants will, however, be required for some years to come for the works at present in progress, and this is not a time at which a large increase in expenditure can be demanded. It will be at least five years before a really adequate annual grant can be allotted to city improvements.

Clearly then, although perhaps capital may be available, the earlier stages of the scheme must be such as will show some return in order that the funds needed may be raised as a loan and not demanded as a grant.

Now the suggestions contained in the improvement scheme come under three heads—

1.—Works undertaken by a public authority from which a reasonable return is anticipated.

2.—Works undertaken by a public authority from which little or no direct return is expected.

3.—Works that can be demanded of private owners under the by-laws or under a Town-Planning Act.

Under the first head may be placed the harbour and railway extensions, any building estates that may be developed by the authorities and, to a limited extent, new streets in occupied areas (in Calcutta some of these are showing a profit). The tramway may also be included, but as it is in the hands of a Company, new concessions should stipulate for lines that will assist the development of public properties.

Under the second would come most of the road improvements in the central area, where these do not assist in developing new sites. Contributions may be obtained from the South Indian Railway and the Tramway Company to the extent of the benefit they receive by the abolition of level crossings and improvement of routes. It is clear that much of the work under this head can only be carried out in instalments spread over a number of years.

Surface drainage and waterways also come into this section except in so far as they are of value in developing inferior land areas.

The third covers most of the roads and other improvements in and around Mylapore. Most of the land here being in private hands, and the resources available not admitting

of large land purchases, the proper course here is to lay down a scheme such as is suggested on the maps, and to require that all developments should be in accordance with such a scheme.

The next procedure is to take stock of the assets that can be placed at the disposal of an improvement authority. Now there is a fair amount of public land in Madras, under the control of either the Municipality, the Madras Government, or the Government of India. These lands are shown on map M.XIII. Leaving out of account those areas that ought to be kept as permanent open spaces there still remain considerable blocks which could be developed. Systematic developments cannot, however, be undertaken without the purchase of other lands which separate these holdings. Fortunately most of this land is cheap and the cost of it would eventually be more than recouped.

With regard to the Government of India (military) lands, some difficulties may arise, but it ought to be possible to secure a grant of the Nedumbarai Workshops, the Ordnance Lines, and the Fort St. George foreshore in view of the fact that these are used for no purpose at all proportionate to their value. Other suitable sites of less inherent value might be offered in exchange.

The map showing these areas also shows those that should be acquired to render possible a comprehensive development scheme.

Thus may be secured a large area which can be developed to meet the steady demand for better housing, and which may reasonably be expected to bring in sufficient to repay the costs of the necessary purchases and works.

Therefore it would not be unsound to borrow from time to time sufficient to meet these costs until the return from sales or leases should reach a point that would cover first the interest on borrowing, and subsequently the expenditure.

Assuming that the Improvement Authority could obtain on loan some 15 lakhs of rupees annually for a term of 10 years it should at the end of this time be able to balance income and expenditure, or alternatively, if this be too optimistic an estimate, drawings of 10 lakhs per annum for 15 years should place things in a similar position.

This suggested loan would not obviate the necessity for an annual grant of say 8 to 10 lakhs per annum which would be a reasonable contribution from the Madras Government towards the improvement of its capital, but, as has been pointed out, it is unlikely that such a sum will be available for some years to come.

It is believed that the financial programme here sketched out will, with the aid of a Town Planning Act, enable the scheme laid down to be regarded as a basis for prompt action in respect to the improvement and embellishment of the city of Madras.

ADMINISTRATION AND CONTROL.

European practice places the control of improvement schemes in the hands of the municipality, and this would in the ordinary way appear to be the logical course as the work of the development connects up at so many points with the normal municipal activities. In India such a course has not so far been found advantageous. Owing to the more recent organisation of municipal control in the larger cities the machinery does not run so easily as in Europe, and the Corporation usually has its time fully occupied in properly maintaining the permanent services. If the additional burden of remodelling and supervising the working of a Town Planning Act be placed on it, this administrative body will certainly be overweighted, and progress could only be made by means of a drastic reorganisation of its structure and methods. Possibly a strong executive committee with a special staff might be successful, but it would be impossible to form this committee from the Corporation as at present constituted, without denuding other committees which are carrying on useful work. Moreover, the confirmation of

the committee's decisions would bring about lengthy discussions and take up time that cannot be spared. Either the personnel of the Corporation would have to be increased to provide for the additional work or an "ad hoc" body must be formed that could devote itself solely to the work of city improvement. Now this latter course is the one that has been more generally adopted in India, and the "Improvement Trust" working independently of the Corporation is the accepted method in Calcutta, Bombay, Baroda, Gwalior, and other cities. To one accustomed to European methods it seems a pity to divide control in this manner, but undoubtedly it has not been done without consideration, and may perhaps be the best way of meeting difficulties such as have been cited above.

The decision between the possible alternatives can only be arrived at by those intimately connected with the various interests of Madras and possibly a special committee might be formed to report to the Governor in Council as to the course best calculated to secure the most satisfactory result.

GENERAL CONCLUSIONS.

The foregoing proposals are of the nature of a broadly conceived sketch with the details left for filling in after closer study. They are submitted for criticism in this form, with the idea that they will emerge from it, possibly with numerous emendations and revisions, but still with many features on which the more detailed work can be built up.

Briefly, this scheme aims at being provocative rather than conclusive, it is based on such information as could be gathered from municipal and other officers who most disinterestedly added this labour to their already arduous duties. It will, therefore, be easily realised that many points would require closer study before a final decision could be arrived at, and that the reasonable course was to make proposals of a general character rather than attempt a degree of detail for which the bases of information might be found inadequate.

Many, in reviewing these suggestions, will be inclined to regard them as too drastic, but it must be borne in mind that they are not intended to represent the work immediately possible or necessary, but are more of the nature of a forecast of appropriate developments in the course of the next 50 years or so.

The formulation of a programme on these lines may naturally be challenged as being impracticable, without much more information than has been accumulated, or indeed that it is possible to secure at the present moment. This may be true to some extent. It may be admitted that such a forecast cannot do more than give a general impression, but the weakness of the usual civic programme is always that the issues of the moment obscure more remote developments, so that there is a constant patching up without a comprehensive scheme in view. The value of an imaginative forecast, even if, as is inevitable, it is not entirely successful, is in drawing attention to the larger possibilities so that when there is a movement in any direction its ultimate development may be more easily recognised.

This brief explanation is necessary in order to make the fact clear that what would otherwise look to be sins both of omission and commission, are deliberate efforts to treat the subject in a broadly generalised and imaginative fashion, this appearing to be the course most needful at the present stage of the programme.

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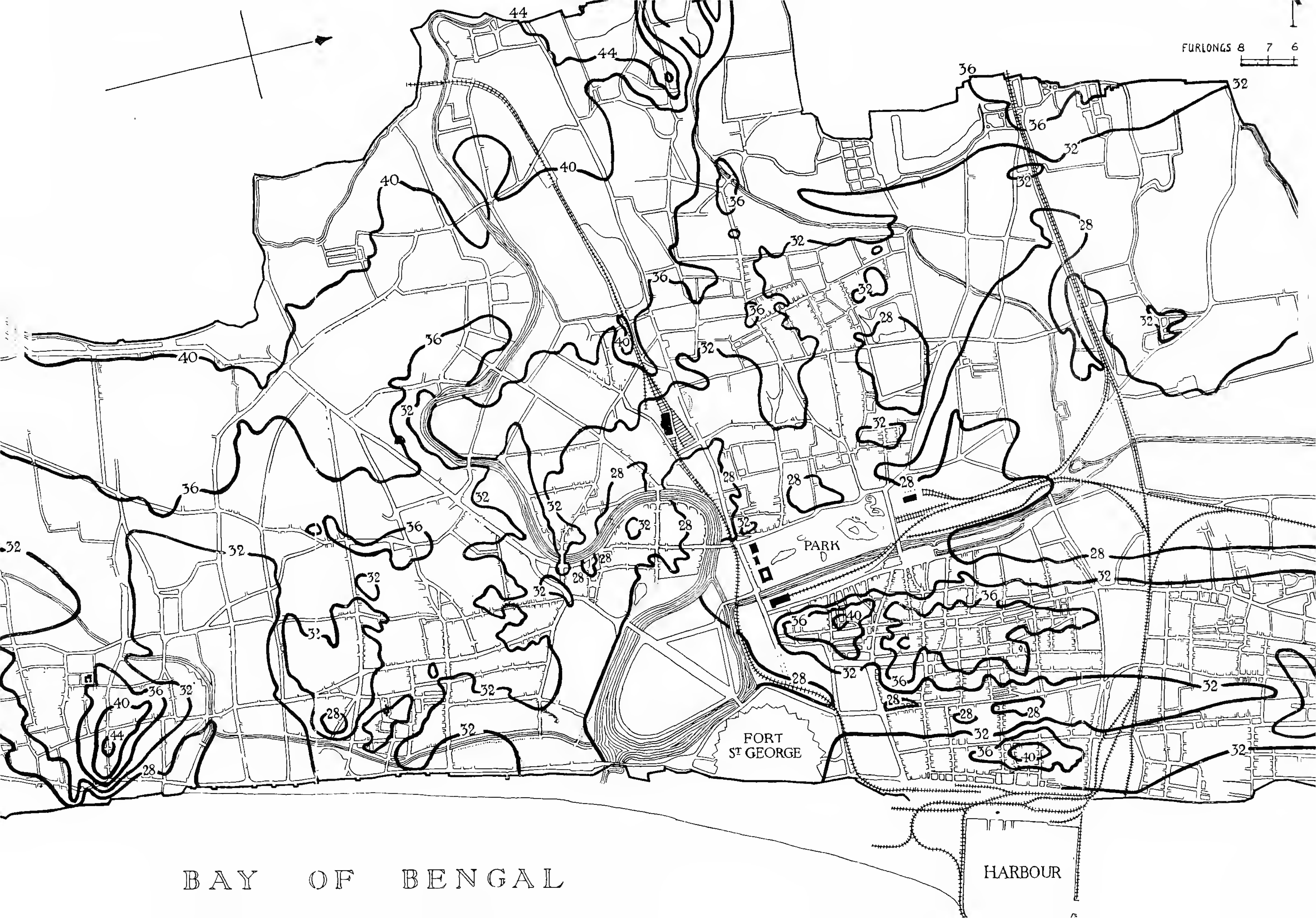
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